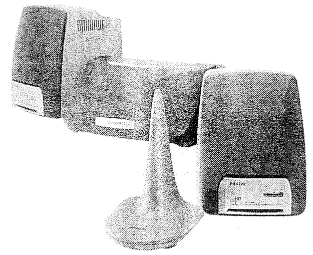
Mini System

FW765P/21/22/34

FW795W/22/37

Service
Service
Service



For repair information on the Wireless Surround Speaker Box, see Service Manual "Wireless Surround Set FB209W".

Service Manual

COMPACT
disc
DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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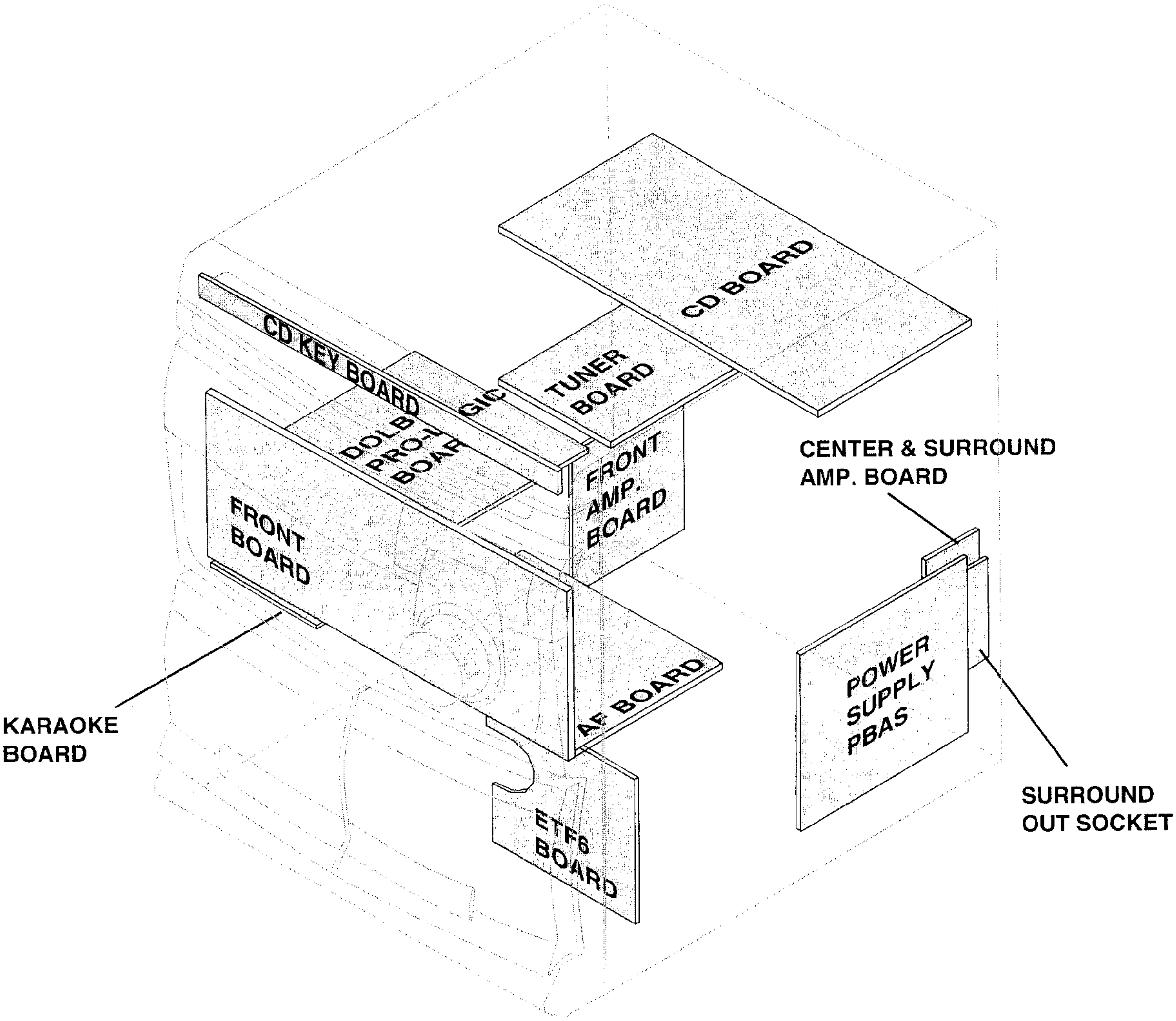
GB 4822 725 25808

PCS 100 294

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS


CD BOARD
CD KEY BOARD
TUNER BOARD
DOLBY PRO-LOGIC BOARD
FRONT AMP. BOARD
CENTER & SURROUND AMP. BOARD
FRONT BOARD
KARAOKE BOARD
AF BOARD
POWER SUPPLY PBAS
SURROUND OUT SOCKET
ETF6 BOARD

VERSION VARIATIONS:

Type /Versions: Features & Board in used:	FW765P						FW795W	
	/21	/22	/34				/22	/37
Aux Input	x	x	x				x	x
Line Output	x	x	x				x	x
Subwoofer Output	x	x	x				x	x
Surround Output	x	x	x				x	x
Digital Output								
Dolby B								
RDS		x	x				x	
Incredible Surround								
Karaoke Feature	x							
Tuner board - ECO5 Sys	x		x					x
Tuner board - Tuner 95		x					x	
Power 4 Module (2 x 40W + 25W + 25W)	x	x	x				x	x
Wireless Surround Set FB209W/00							x	
Wireless Surround Set FB209W/17								x

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30
Mains frequency : 50/60Hz
Power consumption : < 15W at clock mode FTD on
< 75W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 380mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/21M/37
Grid : 9kHz
10kHz for /21/21M/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power DPL Mode (1kHz, 10% THD)
L & R : 2 x 40W RMS at 6 ohms
Center : 20W RMS at 12 ohms
Surround : 20W RMS at 2 x 6 ohms

Frequency response within -3dB : 60Hz-16kHz
Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB Off 1)
Digital Sound Control : Classic, Rock, Techno, Optimal, Jazz 1)
Incredible Surround : IS ON , IS Off 1)
Dolby Pro-Logic : Dolby Surround
: Dolby Center Phantom
: Dolby 3 Stereo
: Normal Stereo

Headphone output at 33 ohm (max. vol) : 0.7V ± 1dB

Input sensitivity
Aux/Line-in : 350mV ± 2dB at 600 ohm
Mic (For simple karaoke only) : 2.5mV ± 2dB at 600 ohm
Output sensitivity
Line-out : 500mV ± 2dB at 22 kohm
Sub-woofer (max. vol.) : 1.5V ± 2dB at 22 kohm
Surround Out (max. vol.) : 500mV ± 2dB at 22 kohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
1.6 x 4.76 cm/sec
Wow and flutter : < 0.4% DIN
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio (IEC I) : > 44dB
Signal to noise ratio (IEC II) : > 47dB

COMPACT DISC:

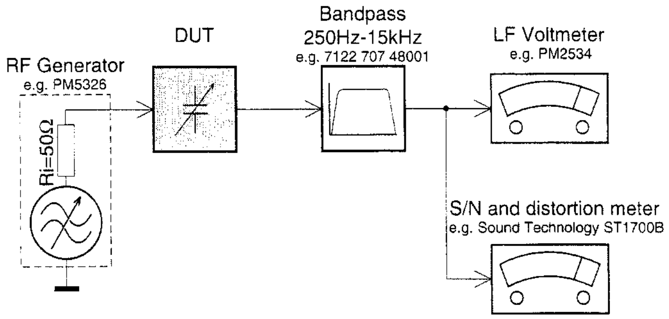
Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 2dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 45dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

1) Frequency response in each setting is software controlled.

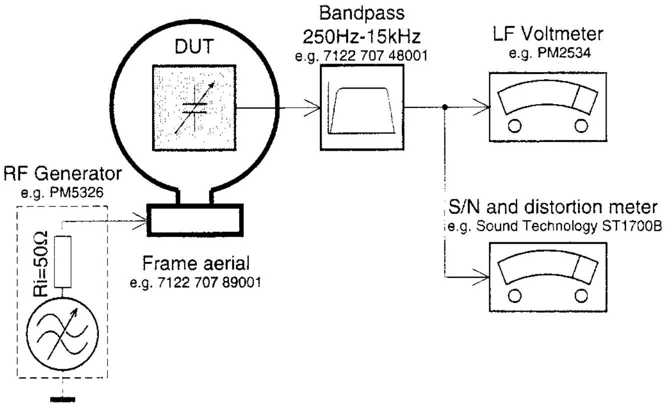
MEASUREMENT SETUP

Tuner FM


RF Generator
e.g. PM5326
Ri=50Ω
DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

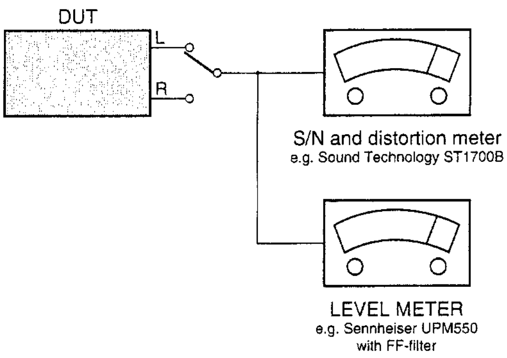
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

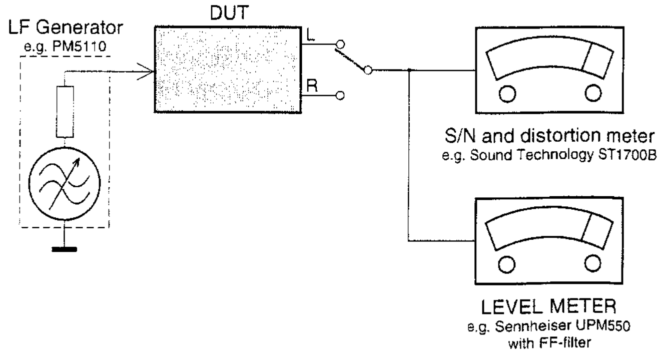
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

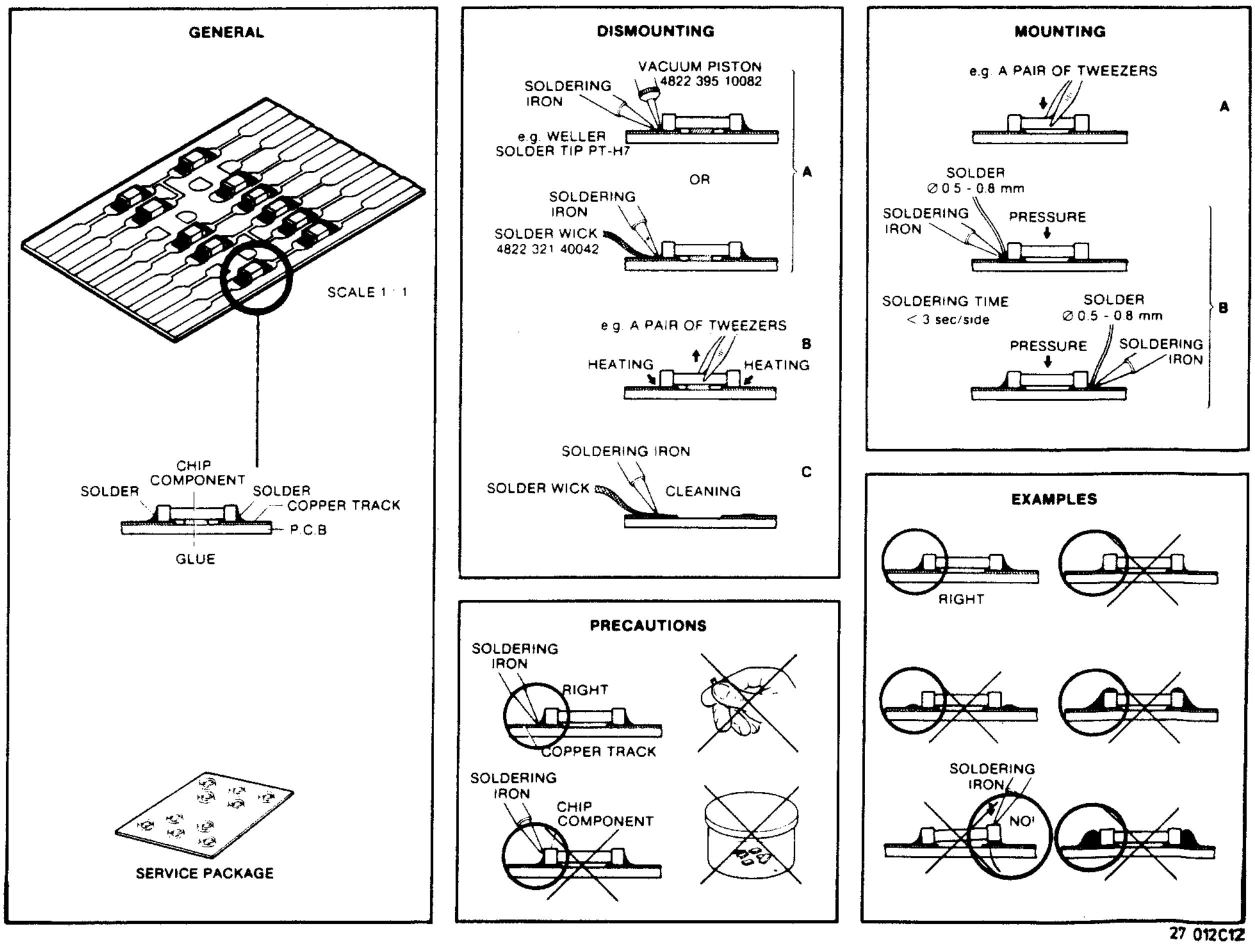
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
A
SOLDERING IRON
SOLDER WICK
4822 321 40042
e.g. A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
C
SOLDER WICK
CLEANING
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
< 3 sec/side
SOLDER
Ø 0.5 - 0.8 mm
B
PRESSURE
SOLDERING IRON
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!

27 012C12

ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

GENERAL INFORMATION

General Information

- ***The typeplate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This product complies with the radio interference requirements of the European Community.***

Environmental Information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials: cardboard (box), polystyrene foam (buffer) and polythene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Acknowledgement

DD DOLBY SURROUND
PRO • LOGIC

Dolby Pro-Logic and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation. Manufactured under license from Dolby Laboratories Licensing Corporation.

Accessories (Supplied)

- Remote control
- Batteries (2 x AAA size) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord
- For model FW775P only - Philips FB 5CS Surround package (includes 2 x surround rear speakers and 1 x center speaker)
- For model FW765P only - Philips FB 3CS Surround package (includes 2 x surround rear speakers and 1 x center speaker)

Accessories (Recommended)

- Philips FB 207W wireless surround speaker package (includes 2 x wireless surround rear speakers and 1 x center speaker and a transmitter unit).
- Philips FB 201 active subwoofer.
- Philips FB 202W wireless active subwoofer.

SAFETY INFORMATION

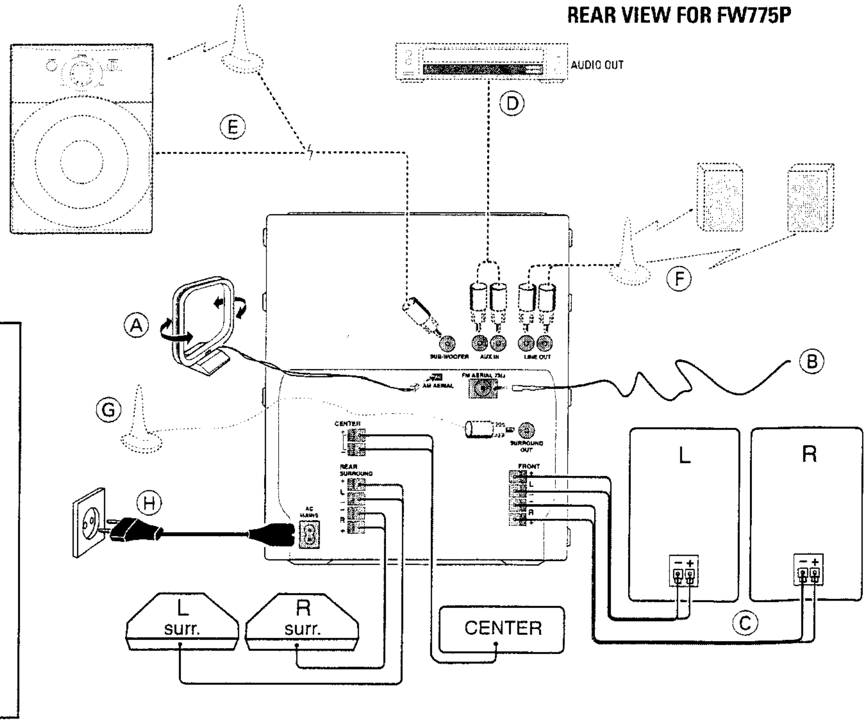
Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- The system incorporates a built-in safety feature that prevents over heating *(for model FW775P only)*.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

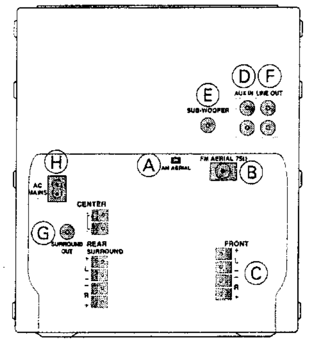
PREPARATION

Rear Connections

REAR VIEW FOR FW775P



REAR VIEW FOR FW765P



PREPARATION

Ⓐ AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

Ⓑ FM Wire Antenna Connection

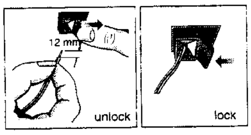
Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Front Speakers' Connection

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.



For Dolby Pro Logic Connection, see page 10.

Ⓓ Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, Laser Disc player, VCR or DVD player to the AUX IN terminals at the rear of the system.

Ⓔ Subwoofer Out Connection

You can connect either an optional active subwoofer (recommended model FB 201) or an optional wireless active subwoofer (recommended model FB 202W) to the SUBWOOFER OUT terminal. The wireless system uses a radio frequency transmitter. The subwoofer reproduces just the low bass effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

Ⓕ Line Out *(wireless ready)*

You may install additional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided that they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Ⓖ Wireless Surround Out Connection

You may connect transmitter unit of the wireless rear speakers (recommended model FB 207W) to the SURROUND OUT terminal instead of the wired rear speakers. Be sure to follow the instructions supplied with the wireless rear speakers.

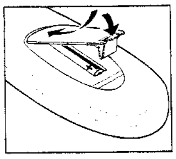
Note:
- *Availability of wireless transmitter and its peripherals are subjected to the approval of local authorities. Please check with respective local safety or approving authority.*

Ⓗ AC Power Supply

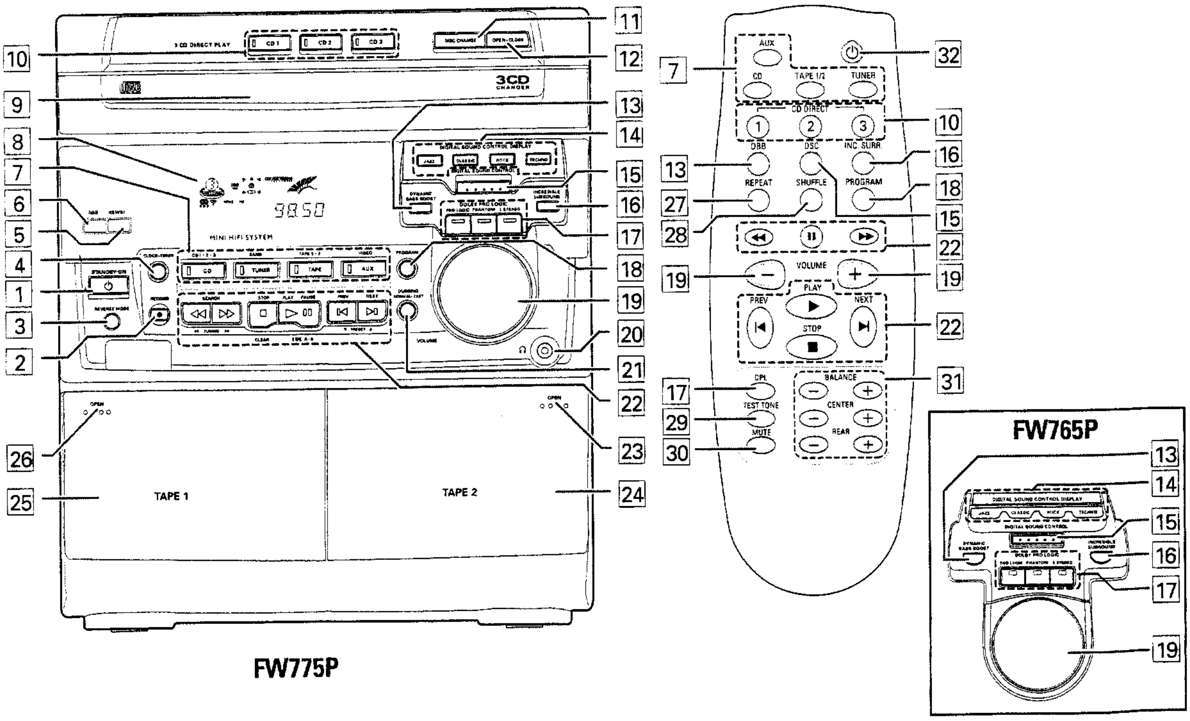
After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

Inserting batteries into the Remote Control

- Insert the batteries (Type R03 or AAA) into the remote control as shown in the battery compartment.
- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R03 or AAA batteries.



CONTROLS



FW775P

Controls on the system and remote control

1 **STANDBY•ON**
- to switch the system on or to standby mode.
- to store radio stations automatically by pressing and holding for 2 seconds *(only in Standby or Demonstration mode)*.

2 **RECORD**
- to start recording on tape deck 2 only.

3 **REVERSE MODE**
- to select the different playback mode on tape deck 2 only.

4 **CLOCK•TIMER**
- to view clock, set clock or timer.

5 **NEWS**
- to hear news at a preset time automatically.

6 **RDS**
- to select RDS data.

7 **SOURCE** : to select the following

CD (CD 1•2•3)	to select CD mode. When in CD stop mode; to select respective disc tray.
TUNER (BAND)	to select Tuner mode. When in Tuner mode; to select the waveband: FM, MW or LW.
TAPE (TAPE 1•2)	to select Tape mode. When tape in stop mode; to select either tape deck 1 or 2.
AUX (VIDEO)	to select external source (e.g. DVD, TV, Laser Disc or VCR sound).

8 **DISPLAY**
- to view the current setting of the system.

9 **CD CAROUSEL TRAY**

10 **3 CD DIRECT PLAY**
- to select a CD tray for playback.

11 **DISC CHANGE**
- to change CD(s).

12 **OPEN•CLOSE**
- to open or close the CD carousel tray.

13 **DYNAMIC BASS BOOST (DBB)**
- to select bass boost level (Beat, Punch, Blast).

14 **DIGITAL SOUND CONTROL DISPLAY PANEL**
- to view the selected DSC setting.

15 **DIGITAL SOUND CONTROL (DSC)**
- to select the desired sound effect : OPTIMAL, JAZZ, CLASSIC, ROCK or TECHNO.

16 **INCREDIBLE SURROUND**
- to switch on or off the surround sound effect.

17 **DOLBY PRO LOGIC (DPL)**
- to select the desired Dolby Pro Logic mode : DOLBY SURROUND, CENTER PHANTOM, DOLBY 3 STEREO or STEREO.

18 **PROGRAM**
- to program CD tracks in CD mode or preset radio stations in tuner mode.

19 **VOLUME**
- to adjust the volume level.

20 **HEADPHONES** 🎧
- to connect headphones jack.

21 **DUBBING**
- to dub a tape in normal or high speed.

22 **MODE SELECTION**

◄◄ SEARCH ►► (◄◄ TUNING ►►)

for CD	to search backward/forward.
for TUNER	to tune to a lower or higher radio frequency.
for TAPE	to rewind or fast forward on tape deck 2 only.

STOP ■ (CLEAR)

for CD	to stop CD playback or clear a program.
for TUNER	to stop programming.
for TAPE	to stop playback or recording.

PLAY ► / PAUSE ❚❚ (SIDE A•B)

for CD	to start or interrupt playback.
for TAPE	to start playback; When playing in tape 2 mode, to change side.

PREV ❘◄ / NEXT ►❘ (▼ PRESET ▲)

for CD	to skip to the beginning of the current or previous/next track.
for TUNER	to select a preset radio station in memory.

23 **OPEN**
- to open tape deck 2.

24 **TAPE DECK 2**

25 **TAPE DECK 1**

26 **OPEN**
- to open tape deck 1.

27 **REPEAT**
- to repeat a CD track.

28 **SHUFFLE**
- to play all the available discs and their tracks in random order.

29 **TEST TONE**
- to check the sound level for Front Left, Front Right, Center and Surround speakers respectively.

30 **MUTE**
- to switch off the sound temporarily or to switch on again.

31 **DPL SOUND CONTROL**

BALANCE +/−	to balance the sound level of the Front Right and Left speakers.
CENTER +/−	to adjust the sound level of the center speaker.
REAR +/−	to adjust the sound level of the surround speakers.

32 ⏻
- to switch the system to standby mode.

Notes for remote control:
- *First select the source you wish to control by pressing one of the source select buttons on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).*
- *Then select the desired function (PLAY, NEXT, etc.).*

Dolby Pro Logic

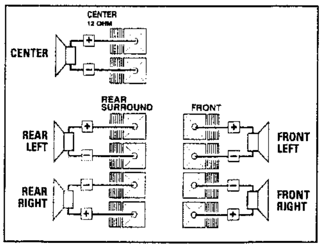
This state-of-the-art Dolby Pro Logic mini system enables you to experience and enjoy a Home Cinema sound ambience. The Pro Logic system allows more accurate definition of the individual sound sources. It produces greater sound separation between channels and provides pinpoint sound localisation. Pro Logic provides four outputs which are called Left, Center, Right and Surround (Rear). Front signals are produced from the pair of Left and Right speakers and a Center speaker. The surround signal is reproduced by two speakers placed at the rear of the listening area. Although the surround signal is mono, a pair of speakers is necessary to produce the correct diffused sound field.

This Pro Logic decoder enables you to decode the following mode : ***Dolby Surround, Center Phantom, Dolby 3 Stereo*** or normal ***Stereo***.

Setting up the Dolby Pro Logic system

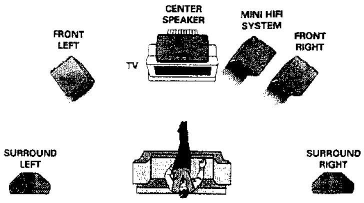
You need to do a proper set up in order for you to enjoy the Home Cinema sound to the fullest. First you need to do a complete speakers' connection.

5-Speakers Connection
- ***Front speakers :*** Connect the black wires to the black FRONT terminals and the red wires to the red FRONT terminals.
- ***Center speaker :*** Connect the black or non-marked wires to the black CENTER terminal and the blue or marked wires to the blue CENTER terminal.
- ***Rear (surround) speakers :*** Connect the black or non-marked wires to the black REAR terminals and the white or marked wires to the grey REAR terminals. You may also connect a pair of wireless rear speakers (not supplied) from the SURROUND OUT terminals.



Positioning the Speakers

To get the best surround sound effect, place the speakers as follow.



Front Left and Right Speakers
For best listening effect, it is recommended to have the Left and Right speakers to form an angle of approximately 45 degrees to the listener. The speakers are magnetic shielded. Should the magnetic field from the speakers affect the picture of the television, you should increase the separation distance.

Center Speaker
For best directional effect, try to have the center speaker at the same height as the left and right speakers and as close as possible to the screen. Place it directly above or beneath the television set. If you use speaker from other make ensure that it is magnetically shielded.

Rear (surround) Speakers
The surround speaker should be placed at normal listening ear level. It can also be mounted on the wall at the back of the room. Most important, sometimes you need to experiment creatively when placing the surround speakers in order to obtain the most ideal sound projection.

Test Tone

This feature enables you to adjust the Front Left, Front Right, Center and Surround sound level of the respective speakers in Dolby Pro Logic mode.

You must sit at the ideal sitting position and use the remote control to perform this operation.

1 Press **CD**, **TUNER**, **TAPE** or **AUX** to switch on the system.

2 Press **TEST TONE**.
  → A test signal is generated and it will move through the Left, Center, Right and Surround speakers respectively.
  → "TEST TONE" will be displayed and followed by "ADAPT BALANCE, CENTER AND REAR LEVEL" message.
  → The test signal will last for about 90 seconds.

3 Press the **BALANCE** — to adjust the desired sound level of front left speaker.
  → The display will show the sound level and "BAL L+XX".

4 Press the **BALANCE** + to adjust the desired sound level of front right speaker.
  → The display will show the sound level and "BAL R+XX".

5 Press the **CENTER** + or — to adjust the sound level of center speaker.
  → The display will show either "CENT +XX or -XX".

6 Press the **REAR** + or — to adjust the desired sound level of surround speaker.
  → The display will show either "REAR +XX or -XX".

7 Adjust the sound level of all the speakers until they are of the same apparent loudness. When you are satisfied with the setting, press **TEST TONE** again to switch off the test signal.

Note:
– It is advisable to set the speakers' level at normal listening level. "XX" denotes the sound level.

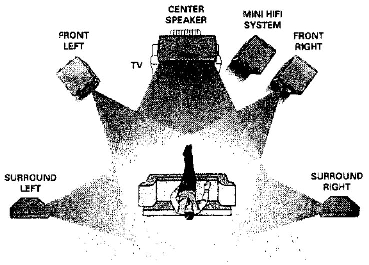
When you have completed the Dolby Pro Logic setup, you are ready to experience and enjoy a Home Cinema sound ambience.

- Press **DPL** on the remote control repeatedly to select and cycle through the various sound mode.

Dolby Surround→ Center Phantom→ Dolby 3 Stereo→ Stereo→ Dolby Surround ...

Dolby Surround

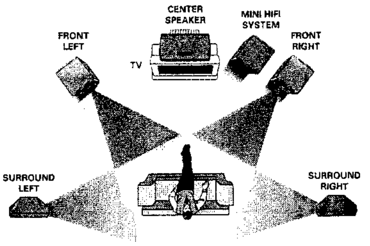
This setting is for a full Dolby Surround Pro Logic mode.



- Press **DPL *PRO LOGIC*** to select Dolby Surround mode.
  → The message "DOLBY SURROUND" will be displayed.

Dolby Center Phantom

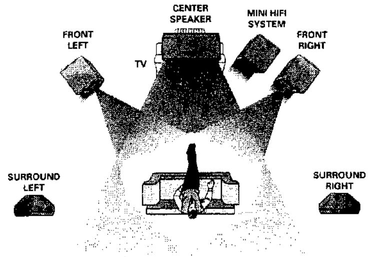
This setting is for use without the center speaker. It redistributes the center channel information to the left and right speakers providing conventional stereo across the front.



- Press **DPL *PHANTOM*** to select Dolby Pro Logic Center Phantom mode.
  → The message "CENTER PHANTOM" will be displayed.

Dolby 3 Stereo

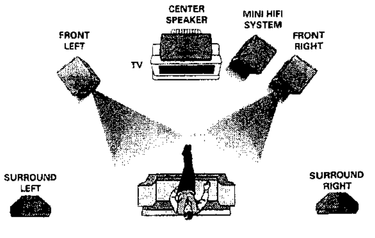
This setting is for use where full surround is not required, but a wide stereo sound is desirable. It only requires the left, right and center speakers.



- Press **DPL *3 STEREO*** to select Dolby 3 Stereo mode.
  → The message "DOLBY 3 STEREO" will be displayed.

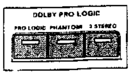
Normal Stereo

This setting is for normal stereo sound without Dolby Pro Logic. It only requires the left and right speakers.



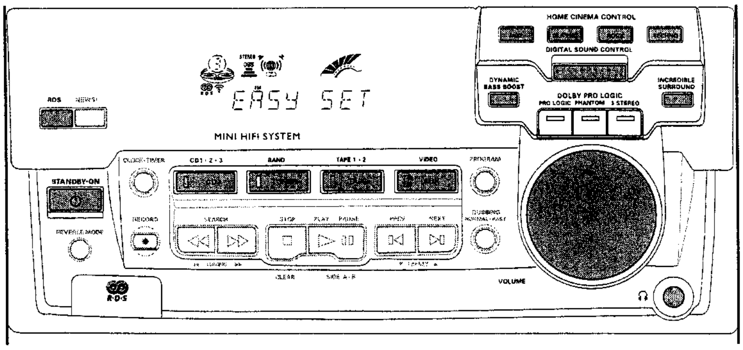
- Press **DPL** to select Stereo mode.
  → The message "STEREO" will be displayed.

Note:
– When in DPL mode, pressing the respective DPL button on the system again (until the button is not lighted) will switch to normal stereo mode.



Important!
1. To listen to the optimum Dolby Pro Logic sound effect, it is recommended to switch on DPL in combination with "Classic" and without Incredible Surround.
2. It is recommended to switch off Dolby Pro Logic when you do recording on a tape.

OPERATING THE SYSTEM



Important:
Before you begin operating the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.***

Notes:
- *During demonstration mode, if you press any source (or standby-on) button, the system will switch to the respective (or standby) mode.*
- *When the system is switched to standby mode, 5 seconds later, the demonstration mode will begin again.*

To cancel demonstration mode
- Press and hold **STOP ■** *(on the system only)* for ***3 seconds*** to stop the demonstration.
  - → The demonstration mode will be switched off permanently.
  - → The system will switch to standby mode. About 5 seconds later, the system will go into an economy power conservation mode *(for model FW775C only)*.

Easy Set *(only in Standby or Demonstration mode)*

EASY SET allows you to store all available radio stations and RDS stations in a particular band (FM•MW•LW) automatically (see Easy Set under TUNER section).

Switching the system ON

- Press **STANDBY•ON** *(on the system only)*, **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the 3 CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
  - → The display indicates the selected source.

Note:
- *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals.*

OPERATING THE SYSTEM

Sound Control

VOLUME ADJUSTMENT
Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening
Connect the headphones jack to the ♫ socket at the front of the system. The speakers will be muted and DPL mode will be switched off.

DIGITAL SOUND CONTROL (DSC)
The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

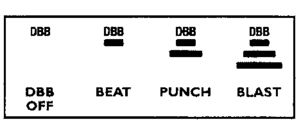
- Press **DIGITAL SOUND CONTROL (DSC)** to select **OPTIMAL**, **JAZZ**, **CLASSIC**, **ROCK** or **TECHNO**.
  - → The Digital Sound Control display panel will light up respectively. At OPTIMAL setting, the DSC display panel does not light up.
  - → "OPTIMAL, JAZZ, CLASSIC, ROCK or TECHNO" will be displayed.

Automatic DSC-DBB selection
The best setting for the DBB is automatically generated for the respective DSC selection. You can also manually select the DBB setting that best suits your listening environment.

DSC Selection		DBB Selection
Optimal	→	Punch
Jazz	→	Punch
Classic	→	Beat
Rock	→	Blast
Techno	→	Blast

DYNAMIC BASS BOOST (DBB)
The DBB mode enhances the bass response.

- Press **DBB** briefly to select the various level of bass boost.
  - → The DBB button lights up.
  - → "BEAT, PUNCH or BLAST" will be displayed.



To switch off DBB
- Press **DBB** briefly until the DBB button light is switched off.
  - → "DBB OFF" will be displayed.

Note:
- *Some CDs or tapes might be recorded in high modulation. It may cause distortion at high volume. If this occurs, switch off Incredible Surround (if available), DBB level or reduce the volume.*

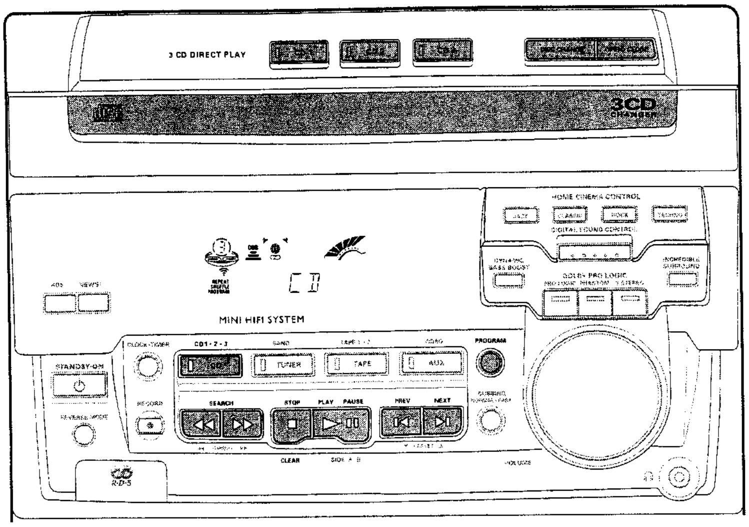
INCREDIBLE SURROUND
Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

- Press **INCREDIBLE SURROUND** to switch on.
  - → The INCREDIBLE SURROUND button lights up.
  - → "IS" will be displayed.

To switch off Incredible Surround
- Press **INCREDIBLE SURROUND** again.
  - → The INCREDIBLE SURROUND button light is switched off.
  - → "IS OFF" will be displayed.

MUTE *(only on remote control)*
This feature allows you to temporarily switch off the sound of the system without switching off the system when you require a moment of silence.

- Press **MUTE** on the remote control to switch off the sound.
  - → "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.



Warning!

1) This system is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.

2) Do not load more than one disc into each tray.

3) When the CD changer is loaded with CD(s), do not turn over or shake the system. This may jam the changer.

You can load up to three discs in the CD changer for continuous playback without interruption.

Loading the CD Changer

1. Press **CD** to select CD mode.
2. Press **OPEN•CLOSE**.
   → The CD compartment slides out.
3. Load a CD with the printed side up in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press **DISC CHANGE**.
  → The CD changer carousel will rotate until the empty tray is at the right hand side and is ready for loading.
  → Playback will always start with the disc in the outer right disc tray.
4. Press **OPEN•CLOSE** to close the CD compartment.
   → The total number of tracks and playing time of the last selected disc appear on the display.

3 CD Direct Play

- You can play a CD directly by pressing the corresponding **3 CD DIRECT PLAY (1 - 3)** button. The CD player will stop at the end of playback of the selected disc.
  → When the button is lighted, it indicates that there is a disc loaded in the disc tray.

Playing a CD

1. Press **PLAY ▶** to start playback.
   → The disc tray, track number and elapsed playing time of the current track appear on the display.
   → The LED on the respective 3 CD Direct Play button will be flashing.
- To interrupt playback, press **PAUSE II**.
  → The playing time flashes.
- To resume playback, press **PLAY ▶** again.
2. To stop playback, press **STOP ■**.

Note:
- *All the available discs will be played once, then stop. When the CD has stopped playing, the system will switch to the standby mode after 15 minutes if no button is pressed.*

Disc Change

You can change the outer 2 discs while the third inner disc is at the stop or playback mode.

1. Press **DISC CHANGE**.
   → The CD compartment slides out.
2. Replace the discs in the left and right disc trays.
- If you press **DISC CHANGE** again during playback, the CD will stop playing.
  → The CD carousel tray will rotate until the inner tray is at the right hand side and is ready for changing.
3. Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track at the stop mode

1. Press **PREV I◀** or **NEXT ▶I** until the desired track appears on the display.
2. Press **PLAY ▶** to start playback.
   → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

1. Press **PREV I◀** or **NEXT ▶I** until the desired track appears on the display.
   → The selected track number and elapsed playing time appear on the display.
- If you press **PREV I◀** once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → The volume will be reduced.
- Playback returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible in the stop mode. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

1. Load the desired discs in the disc trays.
2. Press **PROGRAM** to start programming.
   → The PROGRAM flag starts flashing
3. Press the **CD (CD 1•2•3)** to select the desired disc.
4. Press **PREV I◀** or **NEXT ▶I** to select the desired track.
5. Press **PROGRAM** to store the track.
- Repeat steps *3* to *5* to store other discs and tracks.
6. Press **STOP ■** once to end programming mode.
   → The total number of tracks programmed and total playing time appear on the display.

Notes:
- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears in the display instead of the total playing time.*

- *During programming , If no button is pressed within 20 seconds, the system will exit program mode automatically.*

Playing the program

1 Press **PLAY ▶** to start program playback.
   → "PLAY PROGRAM" will be displayed.
   → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track will be played repeatedly.
   → The REPEAT and PROGRAM flags will be displayed.

2 Press **STOP ■** to stop program playback.

Note:
- *If you press any of the 3 CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag will also temporarily disappear from the display and then reappear, when the playback for the selected disc ends.*

Reviewing the program

Reviewing of the program is only possible in the stop mode.

- Press **PREV I◀** or **NEXT ▶I** repeatedly to review the programmed tracks.
- Press **STOP ■** to exit review mode.

Erasing the program *(in the stop mode)*

- Press **CLEAR** on the system.
   → "PROGRAM CLEARED" will be displayed.

Note:
- *The program will be erased when the system is disconnected from the power supply. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "CLEARED".*

Shuffle *(only on remote control)*

It will play all the available discs and their tracks in random order. Shuffle may also be used when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**.
   → "SHUFFLE" will be displayed.
   → The SHUFFLE flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will now be played in random order until you press **STOP ■**.
- If you press **REPEAT** during shuffling, the current track will be played repeatedly.
   → The REPEAT and SHUFFLE flags will be displayed.

2 Press **SHUFFLE** again to resume normal playback.
   → The SHUFFLE flag disappears from the display.

Note:
- *All the available discs will be played once, then stop.*

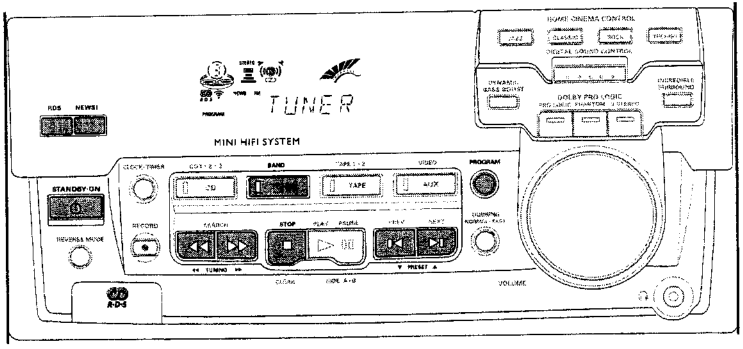
Repeat *(only on remote control)*

It will play the current track repeatedly.

1 Press **REPEAT** during playback.
   → "REPEAT TRACK" will be displayed.
   → The REPEAT flag and the track selected appear on the display.
- The track will now be played repeatedly until you press **STOP ■**.

2 Press **REPEAT** again to resume normal playback.
   → The REPEAT flag disappears from the display.

TUNER



Easy Set *(only in Standby or Demonstration mode)*

EASY SET allows you to store all available radio stations and RDS stations in a particular band (FM•MW•LW) automatically.

1 Press and hold **STANDBY•ON** *(on the system only)* for 2 seconds.
   → "EASY SET" will be displayed and followed by "TUNER".
   → Easy set will start with the last active band.
   → All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

2 The system will search once again for the first available RDS station and to set the RDS time automatically.

- When searching RDS station;
   → "SEARCH RDS STATION" will be displayed. If no RDS station is available, the program will exit automatically.
   → After a station is found, "EASY SET" will be displayed and followed by "TIME".
- When searching RDS time;
   → "SEARCH RDS TIME" will be displayed.
   → When RDS time is read, "RDS TIME" will be displayed. The current time is displayed for 2 seconds and will be stored automatically.

Notes :
- *When EASY SET is used, all previously stored stations will be erased.*
- *The last preset station or the first available RDS will appear on the display when Easy Set is completed.*
- *If RDS station does not transmit RDS time within 90 seconds, the program will exit automatically and the display will show "NO RDS TIME".*

Tuning to Radio Stations

1 Press **TUNER** to select TUNER mode.
   → "TUNER" will be displayed.
   → The preset number, frequency and waveband appear on the display.

2 Press **TUNER (BAND)** again to select the desired waveband : FM, MW or LW.

3 Press **TUNING ◀◀** or **▶▶** for more than one second, then release.
   → The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired radio station is reached.
- To tune to a weak station, briefly press **TUNING ◀◀** or **▶▶** until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Radio Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1. Press **TUNER**.
2. Press **TUNER (BAND)** again to select the desired waveband : FM, MW or LW.
3. Press **PROGRAM** for more than one second.
   → PROGRAM flag starts flashing and "AUTO" will be displayed.
   → Every available radio station will be stored automatically. The frequency and preset number will be displayed briefly.
   → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
   → The system will remain tuned to the last stored preset radio station.

- Repeat the above procedure to store other preset stations for the other waveband. Remember to select the next available preset number before proceeding. If not, some of the preset radio stations may be erased.

Notes:
- *You can cancel the automatic programming by pressing PROGRAM or STOP ■.*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 40 will be programmed.*

Manual programming

1. Press **TUNER**.
2. Press **TUNER (BAND)** to select the desired waveband: FM, MW or LW.
3. Press **PROGRAM** for less than one second.
   → PROGRAM flag, the frequency and preset station number start flashing.
   → The next available preset number will be displayed for selection.
4. Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.

- When all 40 presets are stored, no preset number is shown.
  → The message "PROGRAM FULL" will be displayed.
- If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.

5. Press **PROGRAM** again.
   → PROGRAM flag will stop flashing, and the radio station will be stored.

- Repeat the above procedure to store other preset radio stations.

Notes:
- *You can cancel the manual programming by pressing STOP ■.*
- *During programming, If no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press **PRESET** ▼ or ▲ to select the desired preset number.
  → The preset number, frequency and waveband appear on the display.

Receiving RDS radio station

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The station name is displayed.
- **FREQUENCY:** The frequency of the station is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (and the station name will appear on the display:

- The display normally shows the radio station name if available.
  By repeatedly pressing **RDS** button you can change the type of display information:
  → The display shows in turn:
  STATION NAME → FREQUENCY → PROGRAM TYPE → RADIO TEXT → STATION NAME ...

Note:
- *When you press the RDS button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

RDS Time

Some RDS station may be transmitting a real clock time at an interval of every minute.

Setting the time with RDS clock

1. Press **CLOCK•TIMER**.
   → "-- : --" or current time appears on the display.
2. Press **CLOCK•TIMER** once more to enter clock setting mode.
   → "00:00" or current time starts flashing.
3. Press **RDS**.
   → The message "SEARCH RDS TIME" will be displayed.
   → If the station does not transmit RDS clock, "NO RDS TIME" will be displayed.
   → When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.

News *(only available in Radio Station with RDS)*

You can activate NEWS function in Standby or any source mode except Tuner mode. Once the News PTY (program type) is detected in a RDS station, it will switch to TUNER mode automatically.

To start NEWS function

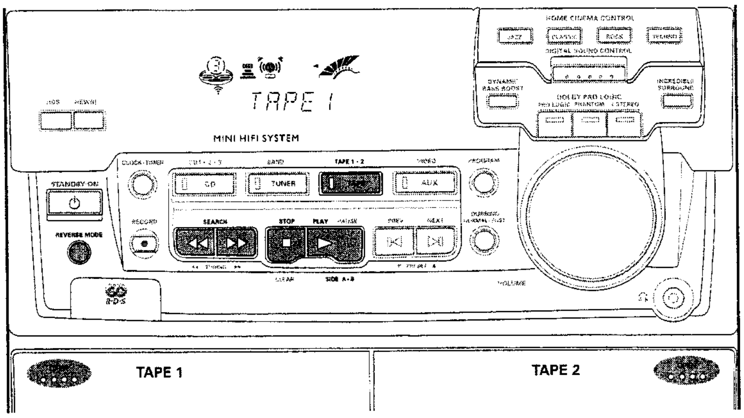
1. Press **NEWS**.

- The NEWS flag and "NEWS ON" will be displayed.
- It will search for the first available RDS station in the presets and wait for the News PTY (program type) to be available. During News PTY search :
  → If **NEWS** activate from Standby or Demo mode, the display will show "WAITING FOR NEWS".
  → If **NEWS** is activated from CD, Tape or Aux mode, the current source activity will be remain uninterrupted.
  → If no RDS station is found after the search, the News function will be switched off. The display will show "NO RDS NEWS" and NEWS flag will disappear from the display.
- When News transmission is detected, the system will switch to Tuner mode.
  → The NEWS flag starts flashing.
- After News has ended, the last selected source mode will be resumed.
  → The NEWS flag will disappear from the display.

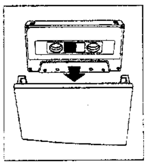
To cancel NEWS function

- Press **NEWS** again.
  → The NEWS flag disappears and "NEWS OFF" will be displayed.
  → The last selected source mode will be resumed.

Notes:
- *During NEWS bulletin, you can press any available source button to cancel NEWS function and execute the relevant source mode.*
- *The NEWS works only once for each activation.*
- *If NEWS is activated from Standby or Demonstration mode, it switches to Tuner mode and the sound will be muted until News is available.*



Loading a tape



- Press **OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.

Tape Playback

1 Press **TAPE** to select TAPE mode.
→ "TAPE 1" or "TAPE 2" will be displayed.
- Press **TAPE** again to select either tape deck 1 or tape deck 2.

2 Load the tape into the desired tape deck.
3 Press **PLAY** ▶ to start playback.
3a *(For Tape Deck 2 only)*
Press **SIDE A•B** to switch playback between sides A and B.
→ The ◀ or ▶ (back or front) flag appears on the display, depending on the side selected.
3b *(For Tape Deck 2 only)*
Press **REVERSE MODE** to select the different type of playback mode *(see auto reverse playback)*.
4 Press **STOP** ■ to end playback.

Notes:
- *To change side before playback begins, use the SIDE button on the remote control.*
- *When the tape has stopped playing, the system will switch to the standby mode automatically after 15 minutes if no button is pressed.*

Auto Reverse Playback *(only on tape deck 2)*

- Press **REVERSE MODE** to select the different playback modes.

—	recording or playback on one side of the tape. The tape stops at the end of one side.
⊐	recording or playback on both sides of the tape. The tape then stops.
⊂⊃	continuous playback on both sides of the tape up to a maximum of 20 times per side unless you press **STOP** ■.

Rewind/Fast Forward *(only on tape deck 2)*

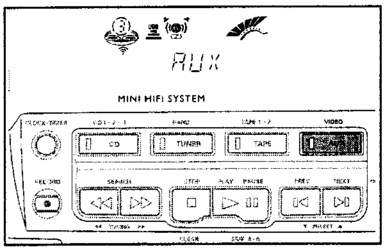
At the stop mode

1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
→ "《《 or 》》" will be displayed depending on which button is pressed.
→ The tape will stop automatically at the end of the rewinding or fast forwarding.
2 Press **STOP** ■ to stop rewind or fast forward.

During playback

- Press and hold ◀◀ or ▶▶ respectively until the desired passage is located.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
- *During rewinding or fast forwarding of a tape, it is possible to select another source (e.g. CD, TUNER or AUX mode).*
- *Check and tighten slack tape with a pencil before use. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV or loudspeaker boxes).*



Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals, you can hear the sound from the system.

- Press **AUX** to select the external mode.
  → "AUX" will be displayed.

Note:
- *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

IT IS RECOMMENDED THAT YOU SWITCH OFF DOLBY PRO LOGIC WHEN RECORDING.

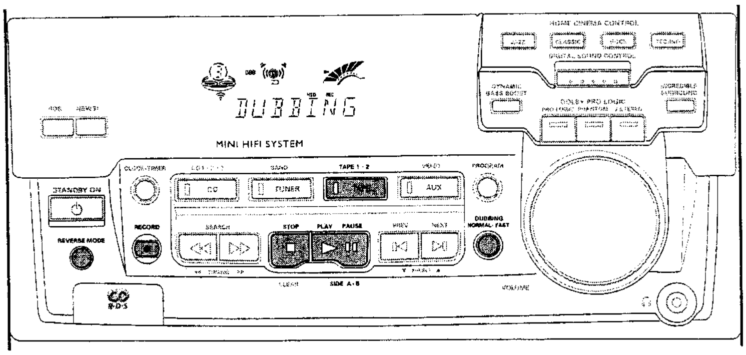
Notes:
- *For recording, use only tape of IEC type I (normal tape) or IEC type II (Chrome).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of VOLUME, DBB or Incredible Surround.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO_2 tape detection hole when covering the tab opening.*

One Touch Recording

- For One Touch Recording, as soon as you press **RECORD**, the current source will be recorded on tape deck 2.

1 Load a blank tape in tape deck 2.
2 Press **RECORD** to start recording.
→ The REC flag starts flashing.
3 Press **STOP** ■ to stop recording.

Note:
- *When you press RECORD at TAPE mode, "SELECT OTHER SOURCE" will be displayed. One Touch Recording is not possible at TAPE mode.*



Recording from other sources *(only on tape deck 2)*

1 Press **TAPE** to select tape deck 2.
2 Load a blank tape into tape deck 2 with the open side downward.
3 Press **SIDE** on remote control to select the recording side.
→ The ◀ or ▶ (back or front) flag will be displayed, depending on the side selected.
4 Press **REVERSE MODE** to select the playback mode (⇄ or ↻).
5 Press **CD**, **TUNER** or **AUX**.
- Start playback of the selected source.

6 Press **RECORD** to start recording.
→ The REC flag starts flashing.
7 Press **STOP ■** to stop recording.

Notes:
– *Only ⇄ or ↻ mode is available during recording.*
– *During recording, it is not possible to listen to another source.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

1 Press **TAPE** to select tape deck 2.
2 Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2.
→ Make sure that the tape in tape deck 1 has its full spool to the left.
3 Press **SIDE** on remote control to select the recording side.
4 Press **DUBBING *once*** for normal speed dubbing or ***twice*** *(within 2 seconds)* for high speed dubbing.
→ "NORMAL" (normal speed) or "FAST" (high speed) will be displayed and then followed by "DUBBING".
→ The HSD flag appears on the display for high speed dubbing.
- Dubbing will start immediately.
→ The REC flag starts flashing.

5 Press **STOP ■** to stop dubbing.

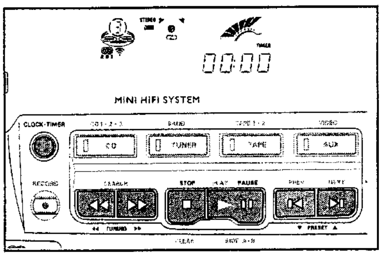
Notes:
– *At the end of side A, flip the tapes to side B and repeat the procedure.*
– *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
– *To ensure good dubbing, use tapes of the same length.*
– *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
– *You can switch to other source while dubbing.*

CD Synchro Start Recording

1 Load a blank tape into tape deck 2 and a disc into the disc tray.
2 Press **CD** to select CD mode.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, the tracks are recorded according to the selected disc.

3 Press **RECORD** to start recording.
→ The REC flag starts flashing.
- CD will start playback automatically.

4 Press **STOP ■** to stop recording.



View Clock

You can view the clock (if it is set) at standby or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK•TIMER** briefly.
→ " 10:25 " (the current time) will be displayed.
→ "- - : - -" will be displayed if the clock is not set.

Clock setting

The clock is set in 24-hour mode, e.g. 00:00 or 23:59 . Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK•TIMER** to select clock mode.
→ "00:00" or the current time starts flashing.
→ "◀◀ , ▶▶ , |◀ , ▶|, ■ " light up.
2 Set the hour with ◀◀ or ▶▶.
3 Set the minute with |◀ or ▶|.
4 Press **CLOCK•TIMER** again to store the setting.
→ The clock starts running.
- To exit without storing the setting, press **STOP ■** .

Notes:
– *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
– *When power interruption occurs, the clock setting is erased.*
– *To set the time with RDS clock, see "RECEIVING RDS RADIO STATION" under TUNER section.*

Timer Setting

- The system can switch on to CD, TUNER or TAPE 1 mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer has to be reset or started again for each subsequent preset time.
- **The volume of the timer will be at the last setting before the system is switched to standby mode.**

1 Press and hold **CLOCK•TIMER** for more than 2 seconds to select timer mode.
→ "ON 00:00" or the last set timer starts flashing. The TIMER flag will be displayed.
→ The last selected source is lighted while other available sources are flashing.
→ "◀◀ , ▶▶ , |◀ , ▶|, ■ " light up.
2 Press **CD**, **TUNER** or **TAPE** to select the desired source.
- Before selecting CD or TAPE mode, make sure that a CD or tape is loaded respectively in the CD tray or tape deck 1.

3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press |◀ or ▶| to set the minute for the timer to start.
5 Press **CLOCK•TIMER** again to store the start time and the selected source.
→ The TIMER is now set.
→ The TIMER flag remains on the display.
- To exit without storing the setting, press **STOP ■** .
- At the preset time, the TIMER will be activated.
→ The selected source will be played.
→ The TIMER flag disappears from the display.

Notes:
– *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
– *If the source selected is TUNER, the last tuned frequency will be switched on.*
– *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*
– *If the source selected is TAPE 1, and if the preset time is reached during high speed dubbing, the TUNER will be selected instead.*

To cancel the TIMER
1 Press **CLOCK•TIMER** for more than 2 seconds.
2 Press **PAUSE ❚❚** to cancel the timer.
→ "CANCEL" will be displayed.
→ The TIMER flag disappears from the display.

To start the TIMER again *(for the same time)*
1 Press **CLOCK•TIMER** for more than 2 seconds.
2 Press **CLOCK•TIMER** again to store the start time and the selected source.

MAINTENANCE

Maintenance

Cleaning the Cabinet
- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs
- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens
- After prolonged usage, dirt of dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available. Follow the instructions supplied with the Lens Cleaner.

Cleaning the Heads and the Tape Paths
- To ensure good recording and playback quality, clean the heads, capstan(s) and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape through once.

Demagnetizing the heads
- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.
- The disc is inserted upside down.

→ *Place CD with printed side up.*
- Moisture condensation at the lens.

→ *Wait until lens has adjusted to normal room temperature.*
- There is no disc in the CD tray.

→ *Insert a CD.*
- The CD is dirty, badly scratched or warped.

→ *Clean or replace the CD.*
- The CD lens is dirty or dusty.

→ *See section under Maintenance.*

TROUBLESHOOTING

Radio Reception

Poor radio reception
- The signal strength is too weak.

→ *Adjust the antenna.*
- The TV or VCR is too close to the stereo system.

→ *Separate the stereo system from the TV or VCR.*

→ *Connect an external antenna for better reception.*

"NO RDS TEXT" is displayed.
- RDS text message is not available.

→ *Select another RDS station.*

Tape Deck Operation

"RECORDING ACTIVE" is displayed.
- A recording is in progress.

→ *Stop the recording or wait until it is finished.*

"TAPE DUBBING ONLY" is displayed.
- Tape dubbing is only possible in tape mode.

→ *Switch source to tape mode.*

Recording or playback cannot be made or there is a decrease in audio level.
- Dirty tape heads, capstans or pressure rollers.

→ *See section on tape deck maintenance.*
- Magnetic build-up in the record/playback head.

→ *Use demagnetizing tape.*

Recorded material sounds strange.
- Tape was recorded in one of the Dolby Pro Logic modes.

→ *Switch off Dolby Pro Logic mode when recording.*

General

System switches to standby mode automatically *(for model FW775 only).*
- The system is operating in an extremely hot environment or internal heat build-up is hign.

→ *This is not a malfunction. The system incorporates a built-in safety feature that prevents overheating.*

→ *Let the system cool down, then switch on again.*

System does not react when any button is pressed.
- Electrostatic discharge.

→ *Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect and switch on the system again.*

No or poor sound.
- Volume is not turned up.

→ *Adjust VOLUME.*
- The headphones are connected.

→ *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.

→ *Check that the speakers are connected correctly.*

→ *Make sure that the stripped speaker wire is clamped.*

Reversed left and right sound.
- Speakers are incorrectly connected.

→ *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.
- Speakers are incorrectly connected.

→ *Check the speaker connection for proper phasing, red/black wires to red/black terminals.*

Remote control has no effect on the system.
- Wrong source is selected.

→ *Select the source (CD, TUNER, etc.) before pressing the function button (PLAY, PREV/NEXT, etc.).*
- The distance to the system is too large.

→ *Reduce the distance.*
- Batteries are inserted incorrectly.

→ *Insert the batteries with their polarities (+/- signs) as indicated.*
- Batteries are exhausted.

→ *Replace the batteries.*

Timer not working.
- Timer is not switched on.

→ *Press CLOCK•TIMER on the system to switch on the timer.*
- Dubbing/recording is in progress.

→ *Stop dubbing/recording.*

System display features automatically and buttons flashing continuously.
- Demonstration mode is switched on.

→ *Press and hold STOP ■ for 3 seconds to switch off the demonstration mode.*

"UNPLUG HEADPHONES" is displayed.
- Headphones is connected.

→ *Disconnect the headphones.*

ADDITIONAL FEATURES

Changing the MW tuning grid

(not available for version /30)

The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step presetted in the factory is 9 kHz.

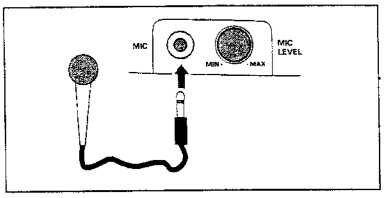
For MW band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

1 Disconnect the system from the AC power supply *(pull out the AC power cord).*
2 Press **TUNER** and **TUNING ▶▶** depressed while reconnecting the system to the AC power supply.
   → Display will show "TUNER" and follow by "GRID 9" or "GRID 10".

Notes:

- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset radio stations will also be erased.*



Karaoke *(not available for version /30)*

Microphone mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2 Connect a microphone to the **MIC** socket.
3 Press **CD**, **TUNER**, **TAPE** or **AUX**.
4 Play the selected source.
5 Adjust the volume level with **VOLUME** control.
6 Adjust the **MIC LEVEL** control to the mixing level that you want.
7 Start singing or talking through the microphone.

Note:

- *It is advisable to switch off Incredible Surround during karaoke.*

Recording the mixed sound/One Touch Recording

- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode *(not available for version /30).*
- For One Touch Recording, as soon as you press RECORD, the current source will be recorded on tape deck 2.

1 Load a blank tape in tape deck 2.
2 Press **RECORD** to start recording.
   → The REC flag starts flashing.
3 Press **STOP ■** to stop recording.

Note:

- *When you press RECORD at TAPE mode, "SELECT OTHER SOURCE" will be displayed. One Touch Recording is not possible at TAPE mode.*

Adjusting the Operating Voltage

(not available for version /30)

Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

ADDITIONAL FEATURES - WIRELESS SURROUND SET

Dolby Pro Logic

This state-of-the-art Dolby Pro Logic mini system enables you to experience and enjoy a Home Cinema sound ambience. The Pro Logic system allows more accurate definition of the individual sound sources. It produces greater sound separation between channels and provides pinpoint sound localisation. Pro Logic provides four outputs which are called Left, Center, Right and Surround (Rear). Front signals are produced from the pair of Left and Right speakers and a Center speaker. The surround signal is reproduced by two speakers placed at the rear of the listening area. Although the surround signal is mono, a pair of speakers is necessary to produce the correct diffused sound field.

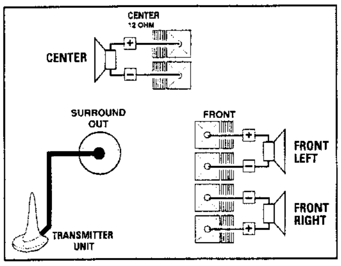
This Pro Logic decoder enables you to decode the following mode : ***Dolby Surround, Center Phantom, Dolby 3 Stereo*** or normal ***Stereo***.

Setting up the Dolby Pro Logic system

You need to do a proper set up in order for you to enjoy the Home Cinema sound to the fullest. First you need to do a complete speakers' connection.

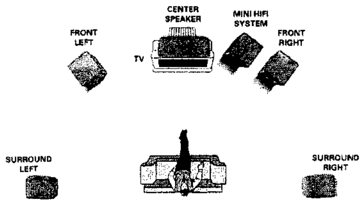
5-Speakers Connection

- ***Front speakers :*** Connect the black wires to the black FRONT terminals and the red wires to the red FRONT terminals.
- ***Center speaker :*** Connect the black or non-marked wires to the black CENTER terminal and the blue or marked wires to the blue CENTER terminal.
- ***Wireless Rear (surround) speakers :*** Connect the active speakers to the mains with the mains cables provided. Switch on the active speakers with the POWER switch.
- ***Transmitter unit :*** Connect the SURROUND terminal of the transmitter unit with the PRE OUT (SURROUND) terminal of the appliance using the supplied cinch cable. Connect the AC/DC adapter supplied to the 14V socket of the transmitter unit. Then connect the AC/DC adaptor to the mains.



Positioning the Speakers

To get the best surround sound effect, place the speakers as follow.



Front Left and Right Speakers

For best listening effect, it is recommended to have the Left and Right speakers to form an angle of approximately 45 degrees to the listener. The speakers are magnetic shielded. Should the magnetic field from the speakers affect the picture of the television, you should increase the separation distance.

Center Speaker

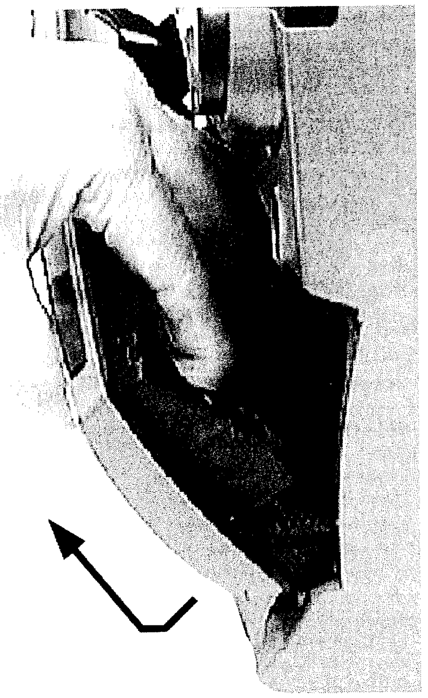
For best directional effect, try to have the center speaker at the same height as the left and right speakers and as close as possible to the screen. Place it directly above or beneath the television set. If you use speaker from other make ensure that it is magnetically shielded.

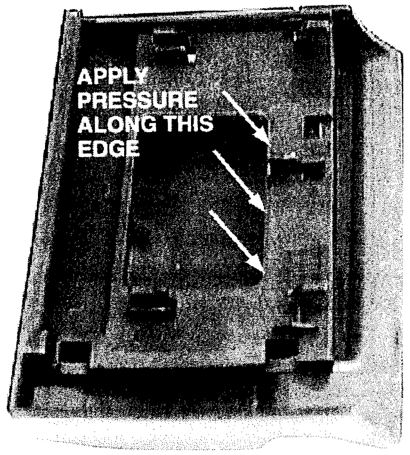
Wireless Rear (surround) Speakers

The surround speaker should be placed at normal listening ear level. It can also be mounted on the wall at the back of the room. Most important , sometimes you need to experiment creatively when placing the surround speakers in order to obtain the most ideal sound projection.

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

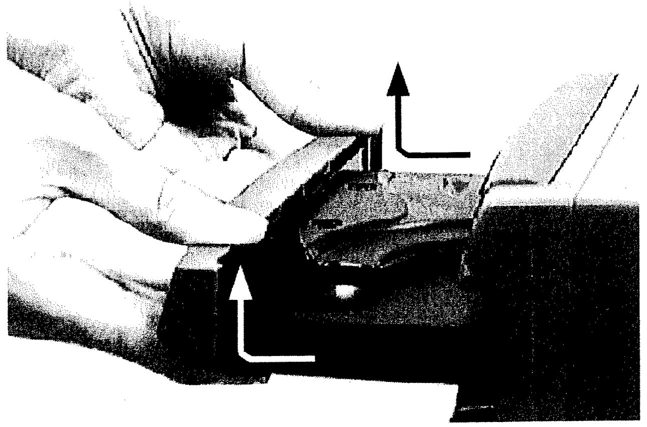




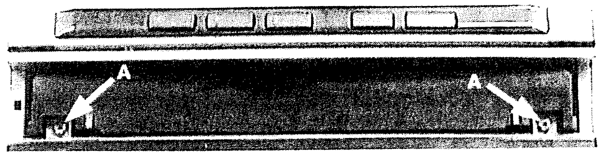
Cassette door

Dismantling of the CDC Module and Front Panel

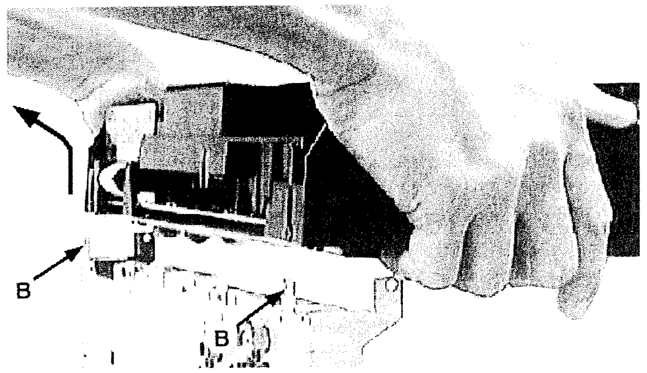
1) Loosen the 19 screws to remove the Cabinet Rear (pos 289).
   - 5 screws each on the left & right side of the Cabinet
   - 9 screws at the rear of the Cabinet
2) Remove the Plate EMC (pos 277).
3) Slide out the tray and remove the Cover Tray CDC (pos 205) as indicated.
4) Loosen the 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
5) Remove 1 screw N (see Rear Portion Picture) and lift the Bar Tuner (pos 272) out of the Rear Plate (pos 284).
6) Remove 1 screw (pos 287) at the bottom of the Bottom Plate to separate the Front Panel Assembly from the Bottom Plate (pos 286).



Remove Cover Tray CDC



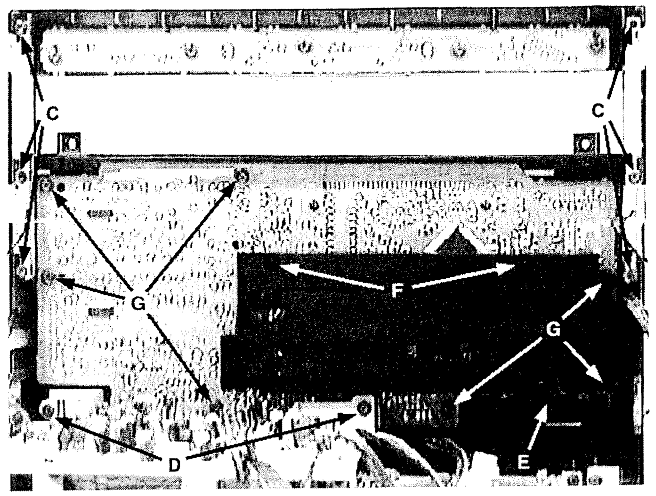
Front CDC



Remove CDC Module

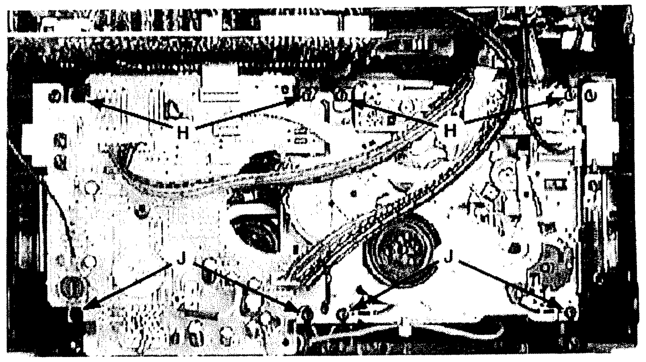
Dismantling of the Front Board

1) Remove 1 screw (pos 274) to loosen the Dolby Pro-logic Board (pos 1107) and lift the Bar Tuner (pos 272) out of the Plate Front (pos 266).
2) Remove 6 screws C as indicated to take out the CDC Left Bracket (pos 267) and CDC Right Bracket (pos 268).
3) Remove 2 screws D as indicated to loosen the AF Board (pos 1101).
4) Remove 1 screw E as indicated to loosen the Karaoke Board (only for set with Karaoke board).
5) Remove 2 screws F as indicated to lossen the Plate Front (pos 266) from the Front Board.
6) Remove 7 screws G as indicated to loosen the Front Board (pos 1102).



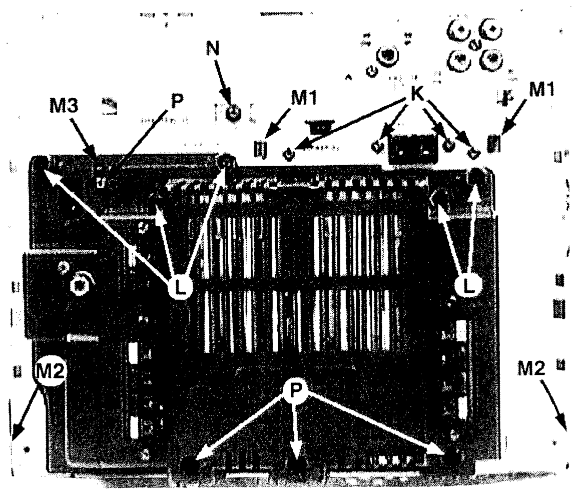
Dismantling of the ETF Module

1) Remove 8 screws (4 screws H and 4 screws J) as indicated to loosen the ETF6 Module (pos 1105).



Dismantling of Rear Portion

1) Remove 4 screws K and uncatch M1 to loosen the Tuner Board (pos 1100).
2) Remove 5 screws L and uncatch M2 to take out the Rear Plate (pos 284).
3) Remove 4 screws P and uncatch M3 to free the Power Module (pos 1103) from the Bottom Plate assembly.

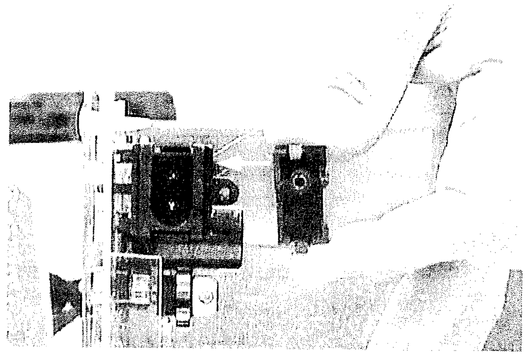


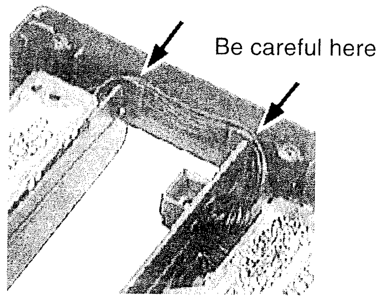
Repair Hints

1) During re-assembly Front board, care should be taken to dress the thin bunch of wires (between Front board & CDC Key board) properly in the slots provided so that it will not be damaged by the CDC bracket (pos 267). See picture 1.

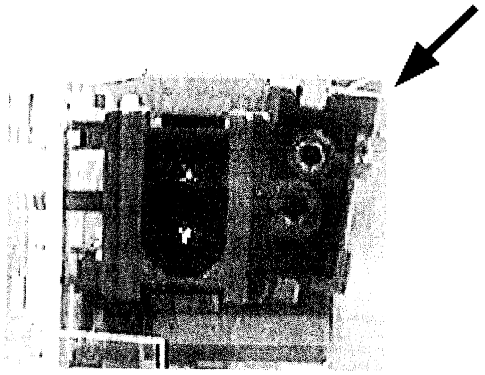
2) During re-assembly of the Rucksack (pos 1103-201), care should be taken to align all Loudspeaker sockets into the openings. Place the Bracket Mains Socket (pos 291) behind the Mains Socket and catch it onto the Rucksack of the Power Module. See pictures 2 and 3.

3) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

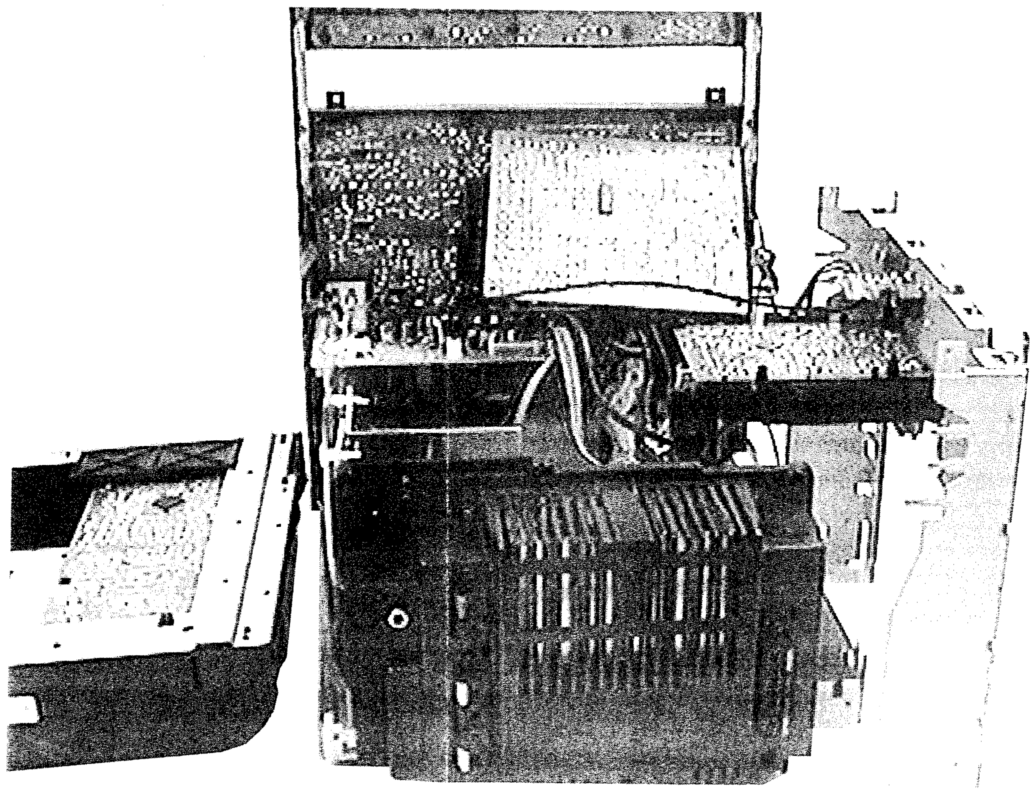

Picture 2



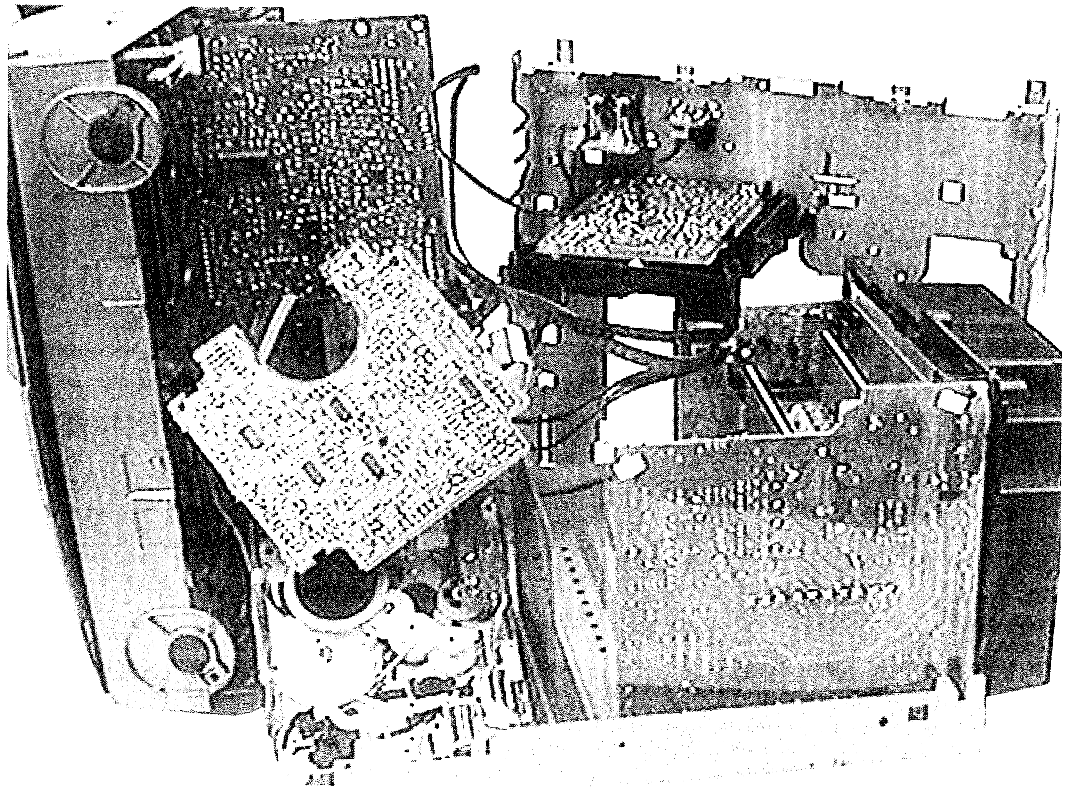
Picture 1


Picture 3

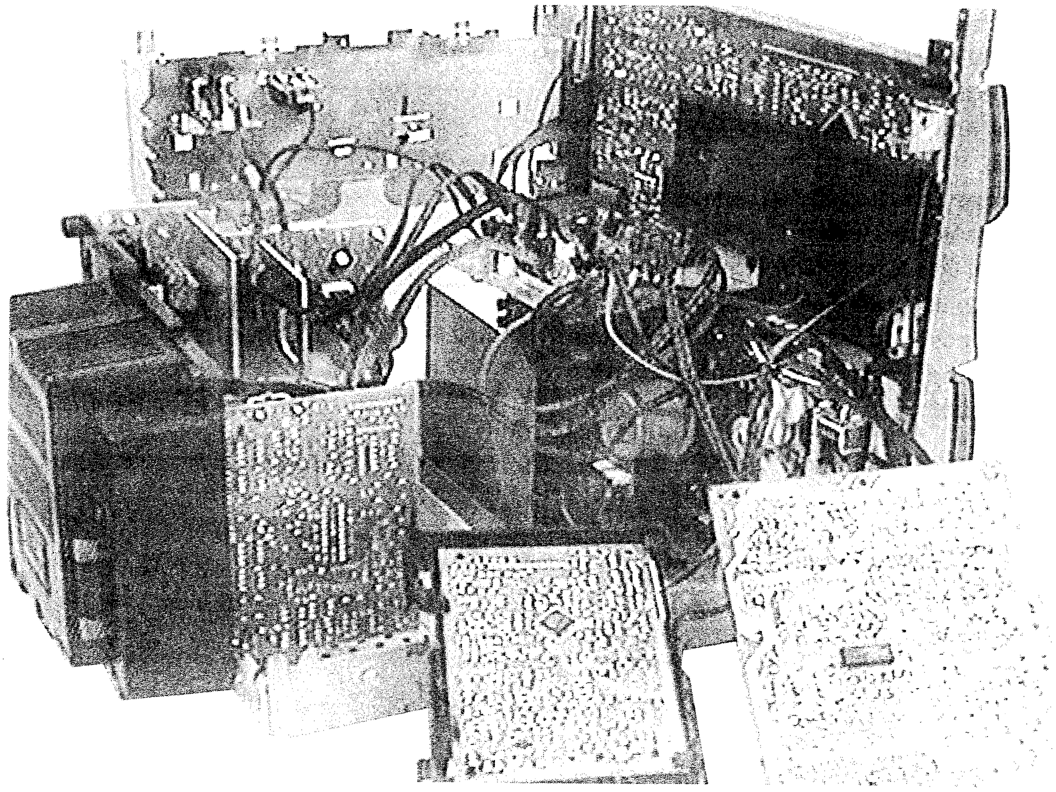
Service pos A



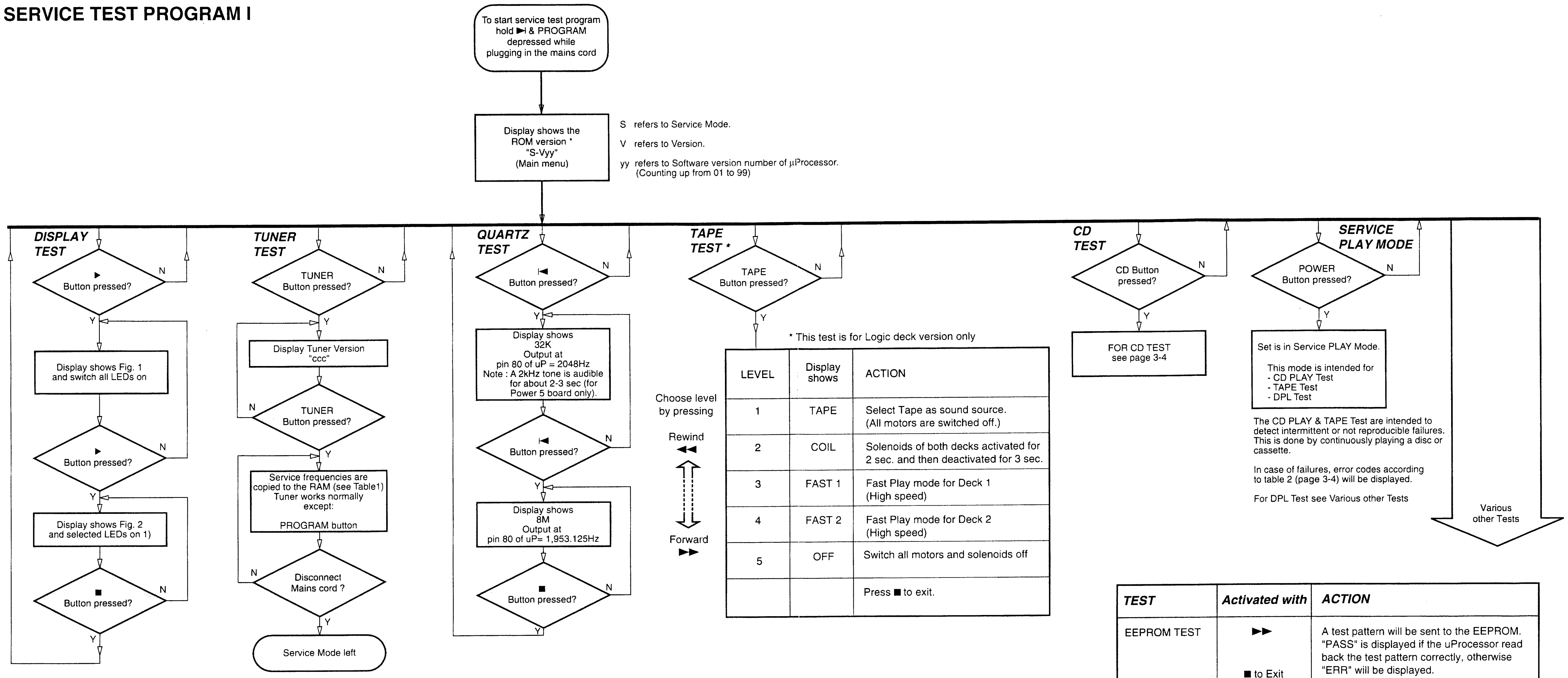
Service pos B



Service pos C



SERVICE TEST PROGRAM I


To start service test program hold ►I & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
DISPLAY TEST
► Button pressed?
Display shows Fig. 1 and switch all LEDs on
► Button pressed?
Display shows Fig. 2 and selected LEDs on 1)
■ Button pressed?
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
I◄ Button pressed?
Display shows 32K Output at pin 80 of uP = 2048Hz Note : A 2kHz tone is audible for about 2-3 sec (for Power 5 board only).
I◄ Button pressed?
Display shows 8M Output at pin 80 of uP= 1,953.125Hz
■ Button pressed?
TAPE TEST *
TAPE Button pressed?
Choose level by pressing
Rewind ◄◄
Forward ►►
CD TEST
CD Button pressed?
FOR CD TEST see page 3-4
SERVICE PLAY MODE
POWER Button pressed?
Set is in Service PLAY Mode.
This mode is intended for
- CD PLAY Test
- TAPE Test
- DPL Test
Various other Tests
Y
N

S refers to Service Mode.

V refers to Version.

yy refers to Software version number of µProcessor. (Counting up from 01 to 99)

* This test is for Logic deck version only

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off
		Press ■ to exit.

The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to table 2 (page 3-4) will be displayed.

For DPL Test see Various other Tests

PRESET	Europe "EUR"	East Eur. 3-band "EAS"	East Eur. 2-band "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"	Japan "JAP"
1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz	76MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz	108MHz	CH3 107.75MHz
3	531kHz	74MHz	74MHz	530kHz	531/530kHz	531kHz	90MHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz	CH1 95.75MHz
5	558kHz	531kHz	531kHz	560kHz	558/560kHz	558kHz	CH2 101.75MHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz	531kHz
7	153kHz	558kHz	558kHz	98MHz	87.5MHz	87.5MHz	1602kHz
8	279kHz	1494kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz	558kHz
9	198kHz	153kHz	98MHz	87.5MHz	87.5MHz	87.5MHz	1494kHz
10	98MHz	279kHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz	80MHz
11	87.5MHz	198kHz	65.81MHz	87.5MHz	98MHz	98MHz	76MHz

Table 1

East Europe TUNER IF offset correction

1) Input a reference frequency 87.5MHz from the generator.

2) Proceed to the Tuner Test Mode

3) Hold TUNER button down for > 3 seconds

4) The set will self-calibrate automatically and display "OFS-xx" when calibration is successful, otherwise it will display "00E".

xx : offset value between -3 to +3

Note: This has to be done whenever the Eeprom, Microprocessor or the components in the oscillator circuitry are replaced.

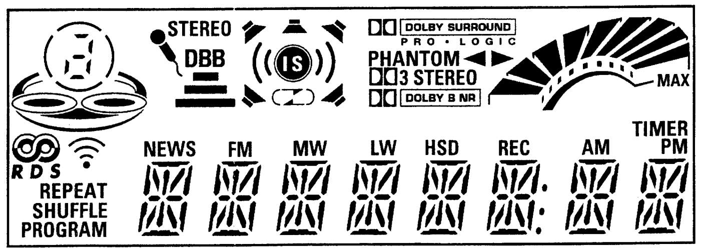
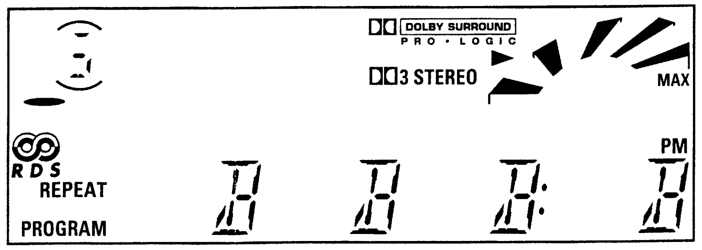

STEREO
DBB
DOLBY SURROUND
PRO · LOGIC
PHANTOM
3 STEREO
DOLBY B NR
MAX
TIMER
PM
NEWS
FM
MW
LW
HSD
REC
AM
RDS
REPEAT
SHUFFLE
PROGRAM

Figure 1


DOLBY SURROUND
PRO · LOGIC
3 STEREO
MAX
PM
RDS
REPEAT
PROGRAM

1) CDC1, CDC3, Tuner, Aux, Incredible Surround, Jazz, Rock, Center Phantom, ◄◄, ►, I◄.

Figure 2

TEST	***Activated with***	***ACTION***
EEPROM TEST	►► ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	◄◄	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	►I ■ to Exit	Key numbers according table 3 are shown on the display. (see Chapter 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
VOLUME TEST	Volume Knob	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DPL TEST (only possible in Service Play mode)	DPL	The set enters into Pro-logic install mode. The noise-source switches between Left, Center, Right and Rear speakers. Pro-logic settings cannot be install in this test.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

F = Fatal error & the set stop play function W = Warning

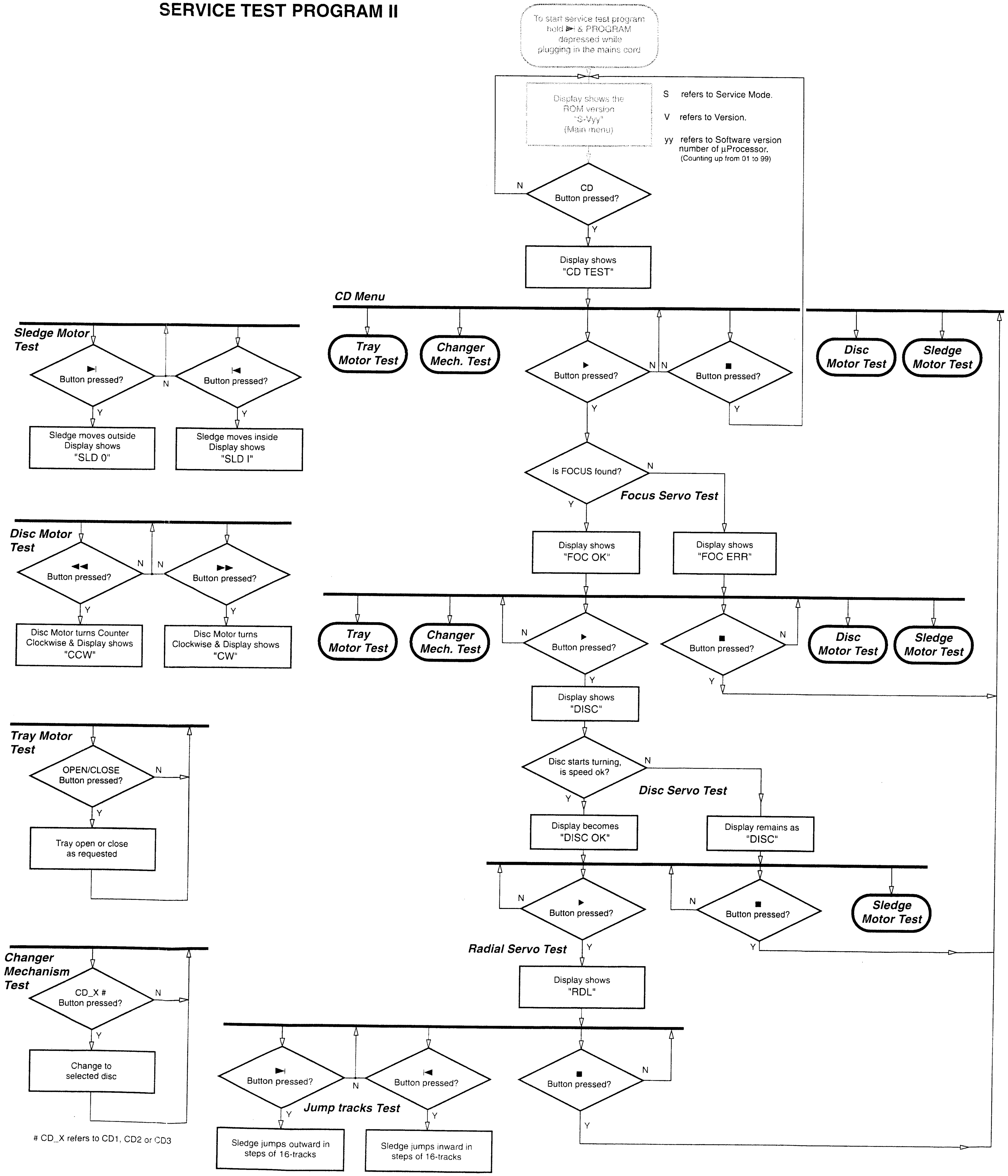
Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	PROLOGIC*	10	MODE*	21
Any Remote control key	RC	PHANTOM*	11	RECORD*	22
CD1*	1	3 STEREO*	12	◄◄	23
CD2*	2	INCREDIBLE SURROUND*	13	►►	24
CD3*	3	STANDBY-ON	14	■	Exit
DISC CHANGE	4	CLOCK / TIMER	15	►II	26
OPEN / CLOSE	5	CD	16	I◄	27
RDS*	6	TUNER	17	►I	28
NEWS*	7	TAPE	18	HSD	29
DSC	8	AUX	19		
DBB	9	PROGRAM	20		

* Not for all type/version

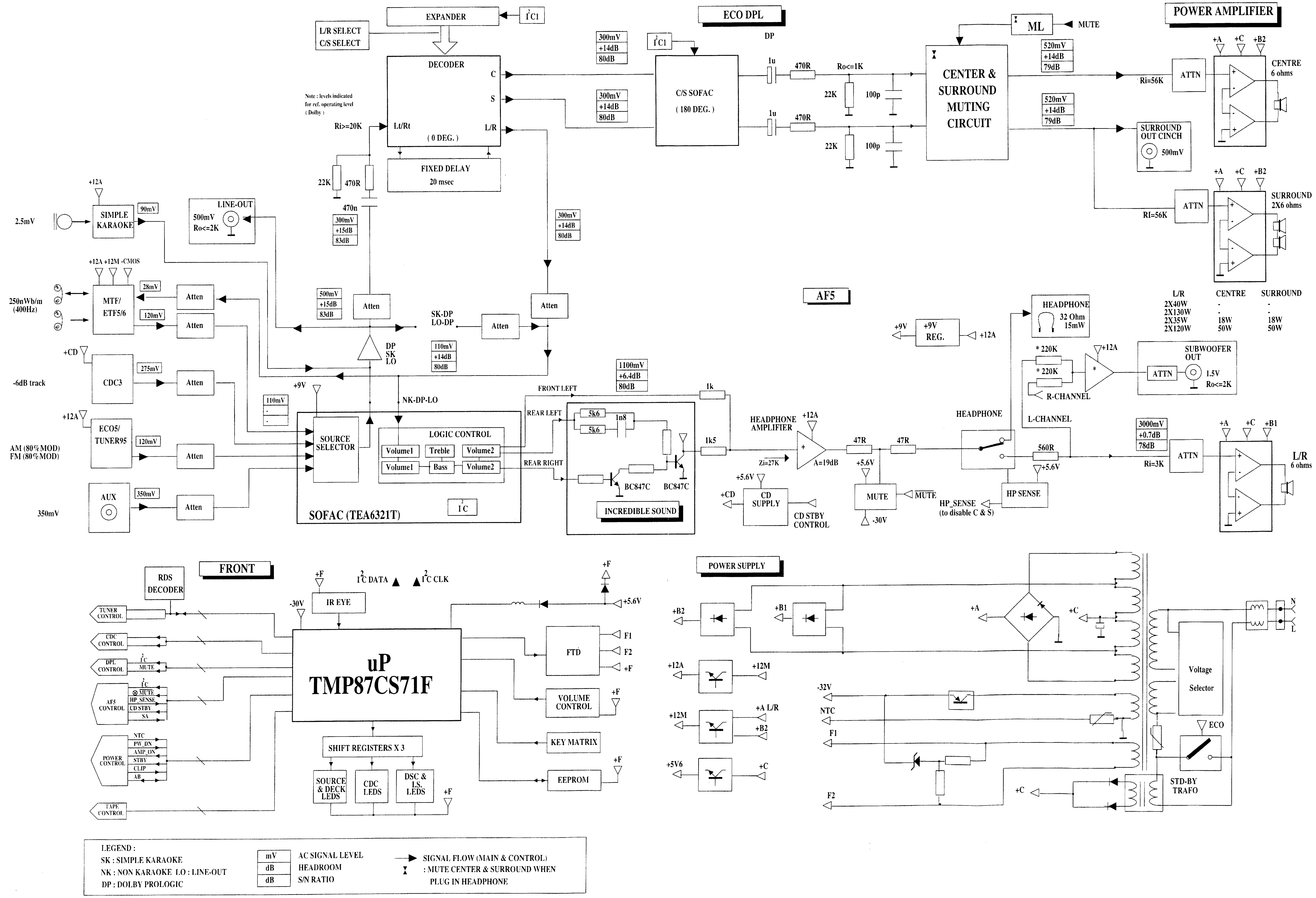
Table 3

SERVICE TEST PROGRAM II


To start service test program hold ►I & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
S refers to Service Mode.
V refers to Version.
yy refers to Software version number of µProcessor. (Counting up from 01 to 99)
CD Button pressed?
N
Y
Display shows "CD TEST"
CD Menu
Tray Motor Test
Changer Mech. Test
► Button pressed?
■ Button pressed?
Disc Motor Test
Sledge Motor Test
Is FOCUS found?
Focus Servo Test
Display shows "FOC OK"
Display shows "FOC ERR"
Display shows "DISC"
Disc starts turning, is speed ok?
Disc Servo Test
Display becomes "DISC OK"
Display remains as "DISC"
Radial Servo Test
Display shows "RDL"
►I Button pressed?
I◄ Button pressed?
Jump tracks Test
Sledge jumps outward in steps of 16-tracks
Sledge jumps inward in steps of 16-tracks
Sledge Motor Test
►I Button pressed?
I◄ Button pressed?
Sledge moves outside Display shows "SLD 0"
Sledge moves inside Display shows "SLD I"
Disc Motor Test
◄◄ Button pressed?
►► Button pressed?
Disc Motor turns Counter Clockwise & Display shows "CCW"
Disc Motor turns Clockwise & Display shows "CW"
Tray Motor Test
OPEN/CLOSE Button pressed?
Tray open or close as requested
Changer Mechanism Test
CD_X # Button pressed?
Change to selected disc

# CD_X refers to CD1, CD2 or CD3

SET BLOCK DIAGRAM

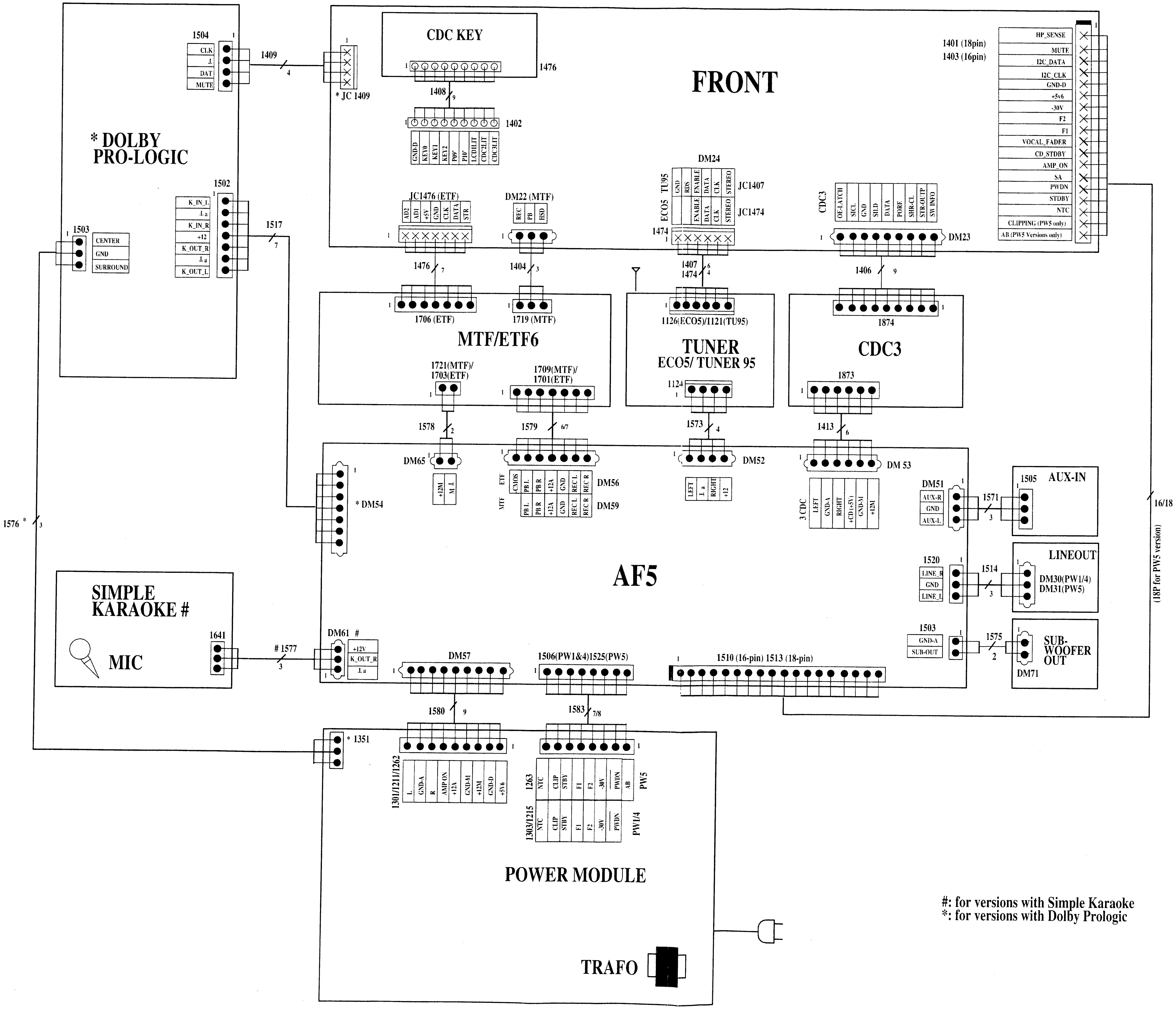

EXPANDER
I²C1
L/R SELECT
C/S SELECT
DECODER
C
S
Lt/Rt
L/R
(0 DEG.)
Ri>=20K
FIXED DELAY
20 msec
Note : levels indicated for ref. operating level (Dolby)
22K
470R
470n
ECO DPL
DP
C/S SOFAC
(180 DEG.)
1u
470R
Ro<=1K
22K
100p
ML
MUTE
CENTER & SURROUND MUTING CIRCUIT
300mV
+14dB
80dB
520mV
+14dB
79dB
POWER AMPLIFIER
ATTN
Ri=56K
RI=56K
CENTRE 6 ohms
SURROUND 2X6 ohms
SURROUND OUT CINCH
500mV
+A
+C
+B2
+B1
2.5mV
SIMPLE KARAOKE
90mV
+12A
LINE-OUT
500mV
Ro<=2K
300mV
+15dB
83dB
+12A +12M -CMOS
250nWb/m (400Hz)
MTF/ ETF5/6
28mV
120mV
Atten
500mV
+15dB
83dB
SK-DP
LO-DP
DP
SK
LO
110mV
+14dB
80dB
+CD
CDC3
-6dB track
275mV
+9V
NK-DP-LO
AM (80% MOD)
FM (80% MOD)
ECO5/ TUNER95
120mV
AUX
350mV
SOURCE SELECTOR
LOGIC CONTROL
Volume1
Treble
Volume2
Bass
SOFAC (TEA6321T)
I²C
FRONT LEFT
REAR LEFT
REAR RIGHT
1100mV
+6.4dB
80dB
5k6
1n8
1k
1k5
BC847C
INCREDIBLE SOUND
AF5
L/R
CENTRE
SURROUND
2X40W
2X130W
2X35W
2X120W
18W
50W
HEADPHONE
32 Ohm
15mW
+9V REG.
* 220K
R-CHANNEL
L-CHANNEL
SUBWOOFER OUT
1.5V
Ro<=2K
HEADPHONE AMPLIFIER
Zi=27K
A=19dB
47R
+5.6V
MUTE
-30V
CD SUPPLY
CD STBY CONTROL
HP_SENSE (to disable C & S)
HP SENSE
560R
3000mV
+0.7dB
78dB
Ri=3K
L/R 6 ohms
FRONT
RDS DECODER
TUNER CONTROL
CDC CONTROL
DPL CONTROL
I²C
MUTE
AF5 CONTROL
⊗ MUTE
HP_SENSE
CD STBY
SA
POWER CONTROL
NTC
PW_DN
AMP_ON
STBY
CLIP
AB
TAPE CONTROL
+F
-30V
IR EYE
I²C DATA
I²C CLK
uP TMP87CS71F
SHIFT REGISTERS X 3
SOURCE & DECK LEDS
CDC LEDS
DSC & I.S. LEDS
FTD
F1
F2
VOLUME CONTROL
KEY MATRIX
EEPROM
+5.6V
POWER SUPPLY
+B2
+B1
+12A
+12M
+A L/R
+B2
+5V6
+C
-32V
NTC
F1
F2
Voltage Selector
ECO
STD-BY TRAFO
N
L

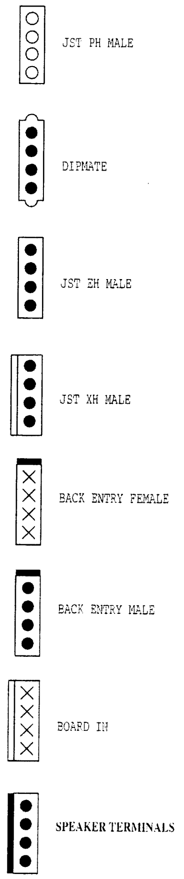
LEGEND :
SK : SIMPLE KARAOKE
NK : NON KARAOKE LO : LINE-OUT
DP : DOLBY PROLOGIC

mV	AC SIGNAL LEVEL
dB	HEADROOM
dB	S/N RATIO

→ SIGNAL FLOW (MAIN & CONTROL)
⧗ : MUTE CENTER & SURROUND WHEN PLUG IN HEADPHONE

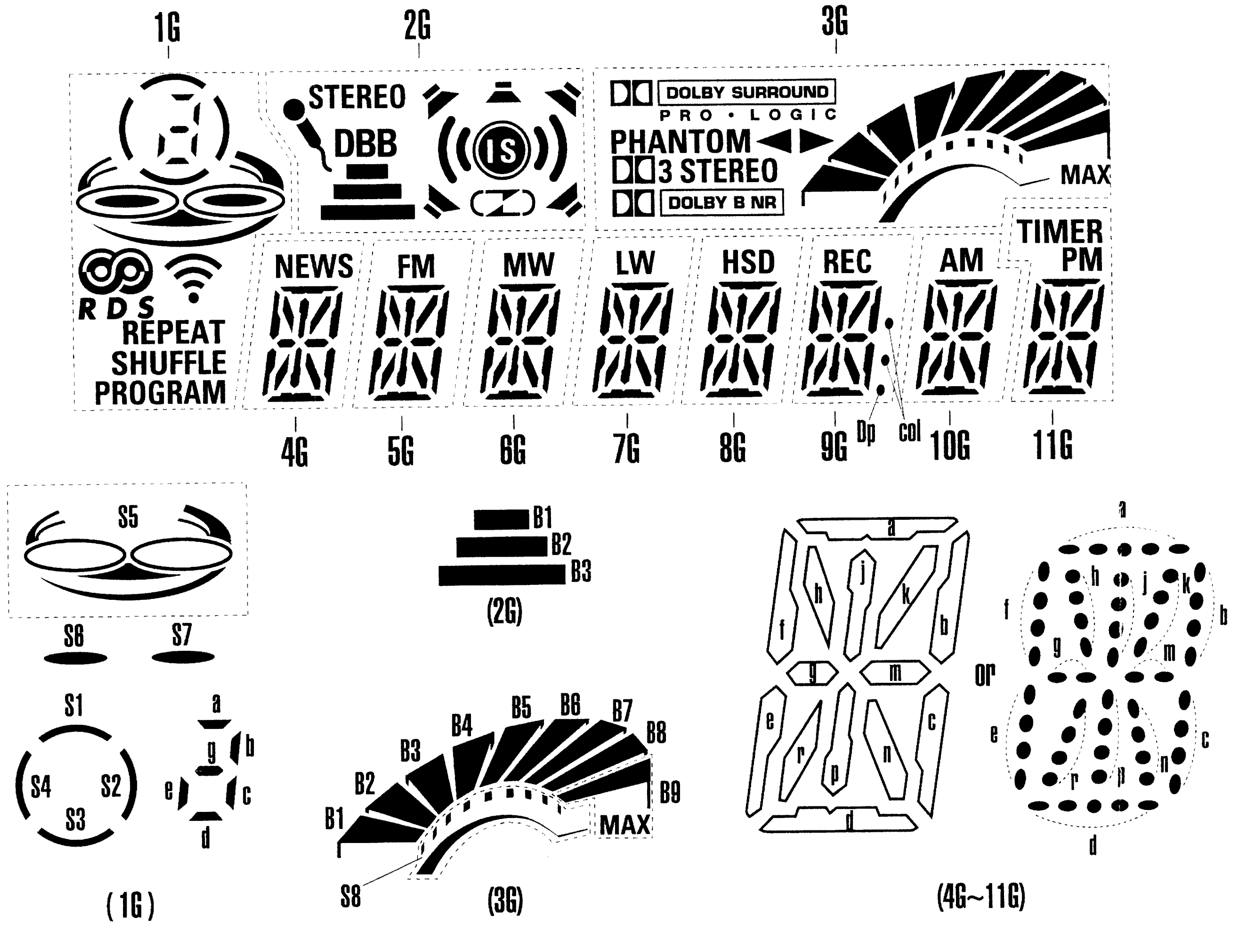
SET WIRING DIAGRAM


FRONT
CDC KEY
1476
1408
1402
GND-D KEY0 KEY1 KEY2 PB0' PI0' LCDLIT CDC2LIT CDC3LIT
JC1476 (ETF)
AD2 AD1 +5V GND CLK DATA STR
DM22 (MTF)
REC PB HSD
DM24
ECO5 TU95
GND RDS ENABLE ENABLE DATA DATA CLK CLK STEREO STEREO
JC1407
JC1474
1474
CDC3
OE-LATCH SICL GND SILD DATA PORE SHR-CL STR-OUTP SW_INFO
DM23
1401 (18pin)
1403 (16pin)
HP_SENSE MUTE I2C_DATA I2C_CLK GND-D +5v6 -30V F2 F1 VOCAL_FADER CD_STDBY AMP_ON SA PWDN STDBY NTC
CLIPPING (PW5 only)
AB (PW5 Versions only)
* DOLBY PRO-LOGIC
1504
CLK ⊥ DAT MUTE
1409
* JC 1409
1502
K_IN_L ⊥a K_IN_R +12 K_OUT_R ⊥a K_OUT_L
1503
CENTER GND SURROUND
1517
1476
1404
1407
1474
1406
MTF/ETF6
1706 (ETF)
1719 (MTF)
1721(MTF)/ 1703(ETF)
1709(MTF)/ 1701(ETF)
TUNER
ECO5/ TUNER 95
1126(ECO5)/1121(TU95)
1124
CDC3
1874
1873
1578
1579
1573
1413
AF5
DM65
+12M M_⊥
DM56
DM59
ETF MTF
-CMOS PB L PB R +12A GND REC L REC R
PB L PB R +12A GND REC L REC R
DM52
LEFT ⊥a RIGHT +12
DM 53
3 CDC
LEFT GND-A RIGHT +CD (+5V) GND-M +12M
* DM54
1576 *
SIMPLE KARAOKE #
MIC
1641
# 1577
DM61 #
+12V K_OUT_R ⊥a
DM57
1506(PW1&4)1525(PW5)
1510 (16-pin) 1513 (18-pin)
DM51
AUX-R GND AUX-L
1571
1505 AUX-IN
1520
LINE_R GND LINE_L
1514
LINEOUT
DM30(PW1/4) DM31(PW5)
1503
GND-A SUB-OUT
1575
SUB-WOOFER OUT
DM71
16/18
(18P for PW5 version)
1580
1583
* 1351
1301/1211/1262
L GND-A R AMP ON +12A GND-M +12M GND-D +5V6
1263
NTC CLIP STBY F1 F2 -30V PWDN AB
PW5
1303/1215
NTC CLIP STBY F1 F2 -30V PWDN
PW1/4
POWER MODULE
TRAFO


JST PH MALE
DIPMATE
JST EH MALE
JST XH MALE
BACK ENTRY FEMALE
BACK ENTRY MALE
BOARD IN
SPEAKER TERMINALS

#: for versions with Simple Karaoke
*: for versions with Dolby Prologic

LCD DISPLAY PIN CONNECTIONS


1G
2G
3G
STEREO
DBB
IS
DD DOLBY SURROUND
PRO · LOGIC
PHANTOM
DD3 STEREO
DD DOLBY B NR
MAX
TIMER
PM
RDS
REPEAT
SHUFFLE
PROGRAM
NEWS
FM
MW
LW
HSD
REC
AM
4G
5G
6G
7G
8G
9G
Dp
col
10G
11G
S5
S6
S7
S1
S2
S3
S4
a
b
c
d
e
g
(1G)
B1
B2
B3
(2G)
B1
B2
B3
B4
B5
B6
B7
B8
B9
MAX
S8
(3G)
a
b
c
d
e
f
g
h
j
k
m
n
p
r
or
(4G~11G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P1	S1	**STEREO**	DD DOLBY SURROUND PRO · LOGIC	a	a	a	a	a	a	a	a
P2	S2	**DBB**	**PHANTOM**	h	h	h	h	h	h	h	h
P3	S3	B1	**DD3 STEREO**	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	B2	DD DOLBY B NR	k	k	k	k	k	k	k	k
P5	a , g , d	B3	B1	b	b	b	b	b	b	b	b
P6	b	◥	B2	f	f	f	f	f	f	f	f
P7	c	◤	B3	m	m	m	m	m	m	m	m
P8	e	▲	B4	g	g	g	g	g	g	g	g
P9	**REPEAT**	IS	B5	c	c	c	c	c	c	c	c
P10	**SHUFFLE**	(( ))	B6	e	e	e	e	e	e	e	e
P11	**PROGRAM**	◣ ◢	B7	r	r	r	r	r	r	r	r
P12	S5	Z	B8	n	n	n	n	n	n	n	n
P13	S6	)	B9	d	d	d	d	d	d	d	d
P14	S7	(	S8	**NEWS**	**FM**	**MW**	**LW**	**HSD**	**REC**	**AM**	**TIMER**
P15	RDS	🎤	▶	-	-	-	-	-	col	-	**PM**
P16	📶	○	◀	-	-	-	-	-	Dp	-	-

Front Boards application

A50350	FW754P/37
A50320	FW755P/30/37
A50460	FW765P/21/21M/33
A50410	FW775P/30/37
A50420	FW775P/22
A50440	FW765P/22/34 , FW795W/22
A50990	FW795W/37

Variations table for Front Board

	A50350	A50320	A50460	A50410	A50420	A50440	A50990
22	x	x	-	-	-	-	-
1401	-	-	-	x	x	-	-
1403	x	x	x	-	-	x	x
1407	-	-	-	-	x	x	-
1458	-	x	x	x	x	x	x
1462,1463	-	-	-	-	x	x	-
1474	x	x	x	x	-	-	x
1476	-	-	x	x	x	x	x
2415	-	-	-	-	100pF	100pF	-
2420	-	-	-	-	47pF	47pF	-
2421,2422	-	-	-	-	47pF	47pF	-
2423	-	-	-	-	560pF	560pF	-
2424	-	-	-	-	2,2μF	2,2μF	-
2425	-	-	-	-	100nF	100nF	-
2438	-	-	-	-	560pF	560pF	-
3533	-	-	-	-	1k	1k	-
3534	-	-	-	-	220k	220k	-
3535	-	-	-	-	2k2	2k2	-
3536	10k	10k	10k	10k	-	-	10k
3537,3538	-	-	-	-	10k	10k	-
3539	10k	10k	10k	10k	-	-	10k
3544	-	220R	220R	220R	220R	220R	220R
3597	10k	10k	10k	4k7	4k7	10k	10k
3603	6k8	6k8	-	-	-	-	-
3604	8k2	8k2	-	-	-	-	-
4421	x	x	-	-	-	-	-
4610	-	-	-	-	x	x	x
4611	-	x	-	x	x	-	x
4612	-	-	x	x	x	x	x
4613	-	x	-	x	x	-	x
4614	x	x	-	-	-	-	x
4615	-	-	x	x	x	x	x
5415	-	-	-	-	x	x	-
5417	-	-	-	-	x	x	-
6003	x	x	-	x	x	-	-
6007	x	-	-	-	-	-	-
6010	-	-	x	-	-	-	-
6031	-	x	x	x	x	x	x
6054	-	-	-	x	x	-	-
7405	-	-	-	-	x	x	-

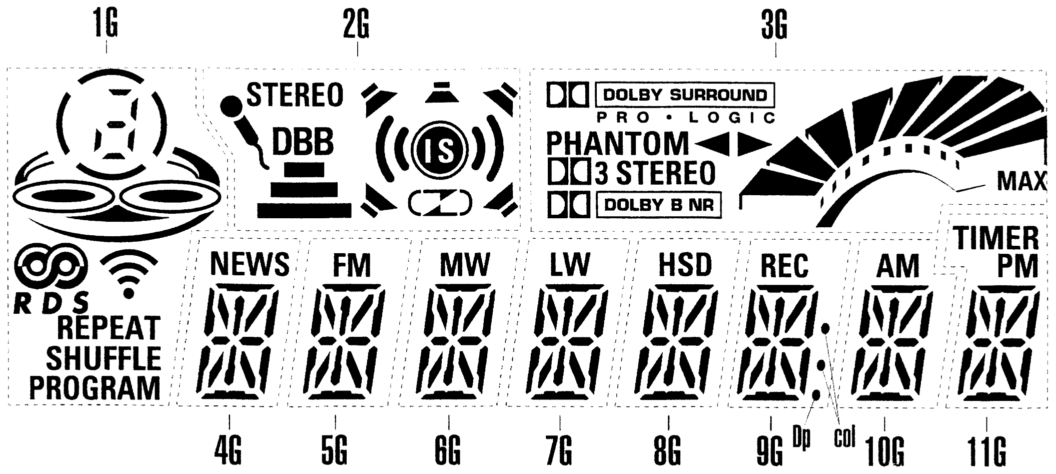
x = Item in use.

FRONT BOARD

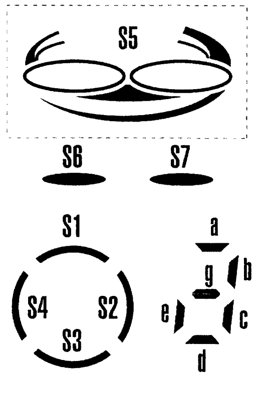
TABLE OF CONTENTS

LCD pin connection & Variation table 6-1
Front Display part - Component & Chip layout 6-2
Front Display part - Circuit diagram 6-3
Key-CDC part - Layouts & Circuit diagram 6-4
Electrical parts list 6-5

LCD DISPLAY PIN CONNECTIONS

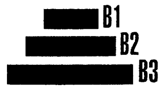


1G
2G
3G
STEREO
DBB
IS
DOLBY SURROUND
PRO • LOGIC
PHANTOM
3 STEREO
DOLBY B NR
MAX
TIMER
PM
RDS
NEWS
FM
MW
LW
HSD
REC
AM
REPEAT
SHUFFLE
PROGRAM
4G
5G
6G
7G
8G
9G
Dp
col
10G
11G

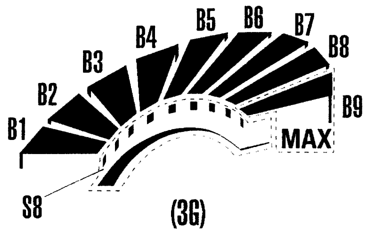


S5
S6
S7
S1
S4
S2
S3
a
b
g
e
c
d

(1G)

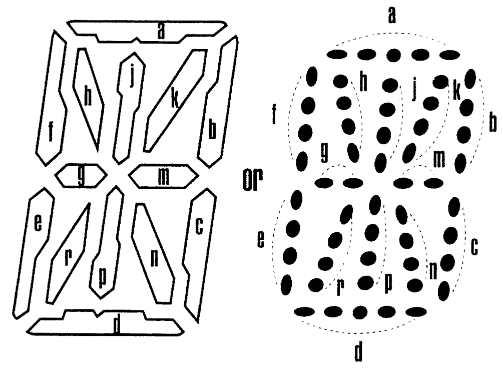


(2G)



B1
B2
B3
B4
B5
B6
B7
B8
B9
MAX
S8

(3G)



a
h
j
k
b
f
g
m
e
r
p
n
c
d
or

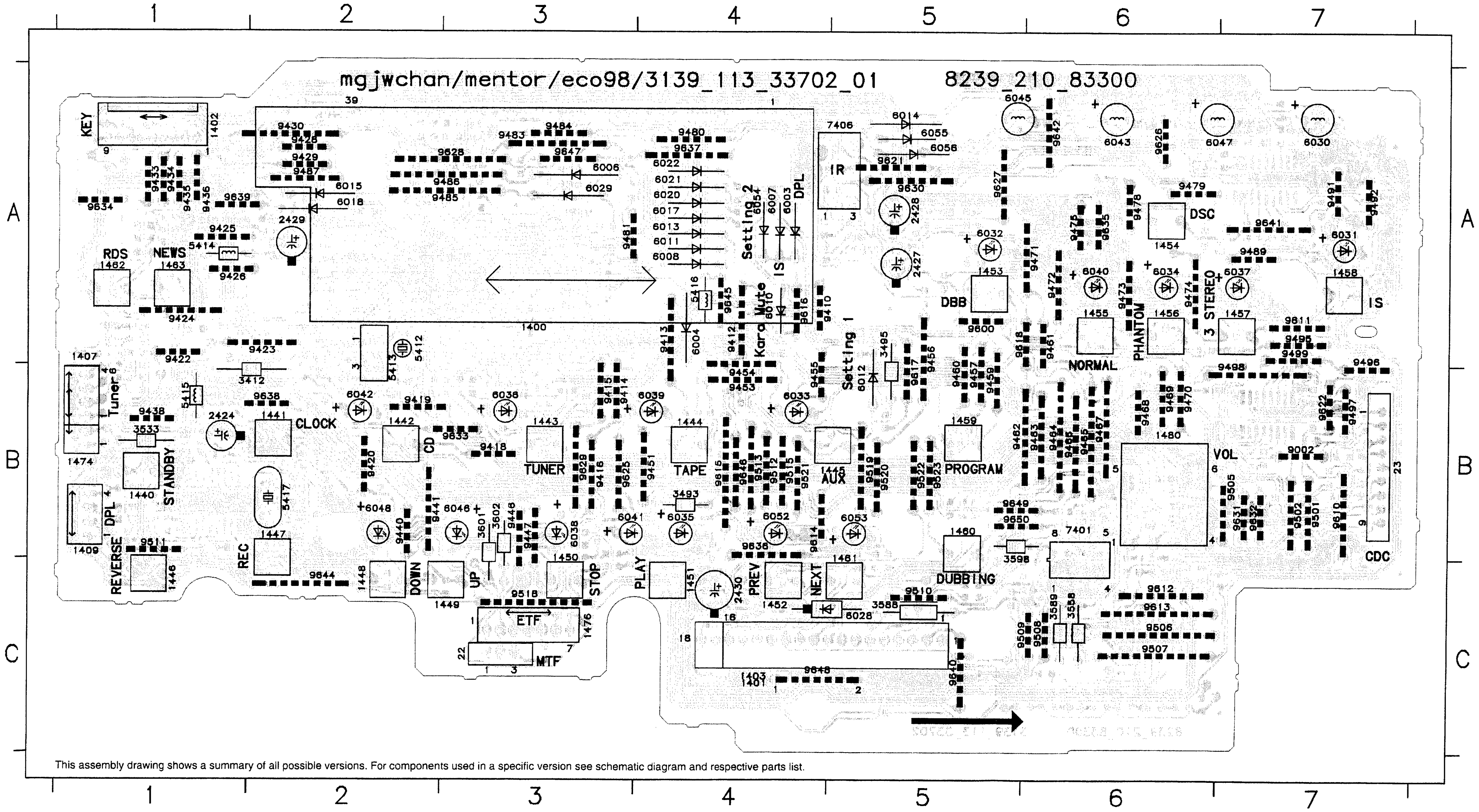
(4G~11G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P1	S1	**STEREO**	DOLBY SURROUND PRO • LOGIC	a	a	a	a	a	a	a	a
P2	S2	**DBB**	**PHANTOM**	h	h	h	h	h	h	h	h
P3	S3	B1	**3 STEREO**	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	B2	DOLBY B NR	k	k	k	k	k	k	k	k
P5	a , g , d	B3	B1	b	b	b	b	b	b	b	b
P6	b	◥	B2	f	f	f	f	f	f	f	f
P7	c	◤	B3	m	m	m	m	m	m	m	m
P8	e	▲	B4	g	g	g	g	g	g	g	g
P9	**REPEAT**	IS	B5	c	c	c	c	c	c	c	c
P10	**SHUFFLE**	(( ))	B6	e	e	e	e	e	e	e	e
P11	**PROGRAM**	◣ ◢	B7	r	r	r	r	r	r	r	r
P12	S5	Z	B8	n	n	n	n	n	n	n	n
P13	S6	)	B9	d	d	d	d	d	d	d	d
P14	S7	(	S8	**NEWS**	**FM**	**MW**	**LW**	**HSD**	**REC**	**AM**	**TIMER**
P15	RDS	🎤	▶	-	-	-	-	-	col	-	**PM**
P16	📶	○	◀	-	-	-	-	-	Dp	-	-

FRONT DISPLAY BOARD - COMPONENT VIEW

22	C3	1444	B4	1456	A6	2427	A5	3601	B3	6008	A4	6028	C5	6040	A6	6056	A5	9420	B2
23	B7	1445	B5	1457	A7	2428	A5	3602	B3	6010	A4	6029	A3	6041	B3	7401	B6	9422	A1
1400	A3	1446	C1	1458	A7	2429	A2	5412	A2	6011	A4	6030	A7	6042	B2	7406	A5	9423	A2
1401	C4	1447	B2	1459	B5	2430	C4	5413	B2	6012	B5	6031	A7	6043	A6	9002	B7	9424	A1
1402	A1	1448	C2	1460	B5	3412	B2	5414	A1	6013	A4	6032	A5	6045	A5	9410	A4	9425	A1
1403	C4	1449	C3	1461	B5	3493	B4	5415	B1	6014	A5	6033	B4	6046	B3	9412	A4	9426	A1
1407	A1	1450	B3	1462	A1	3495	A5	5416	A4	6015	A2	6034	A6	6047	A6	9413	A4	9428	A2
1409	B1	1451	C4	1463	A1	3533	B1	5417	B2	6017	A4	6035	B4	6048	B2	9414	B3	9429	A2
1440	B1	1452	C4	1474	B1	3558	C6	6003	A4	6018	A2	6036	B3	6052	B4	9415	B3	9430	A2
1441	B2	1453	A5	1476	C3	3588	C5	6004	A4	6020	A4	6037	A7	6053	B5	9416	B3	9433	A1
1442	B2	1454	A6	1480	B6	3589	C6	6006	A3	6021	A4	6038	B3	6054	A4	9418	B3	9434	A1
1443	B3	1455	A6	2424	B1	3598	B5	6007	A4	6022	A4	6039	B4	6055	A5	9419	B2	9435	A1

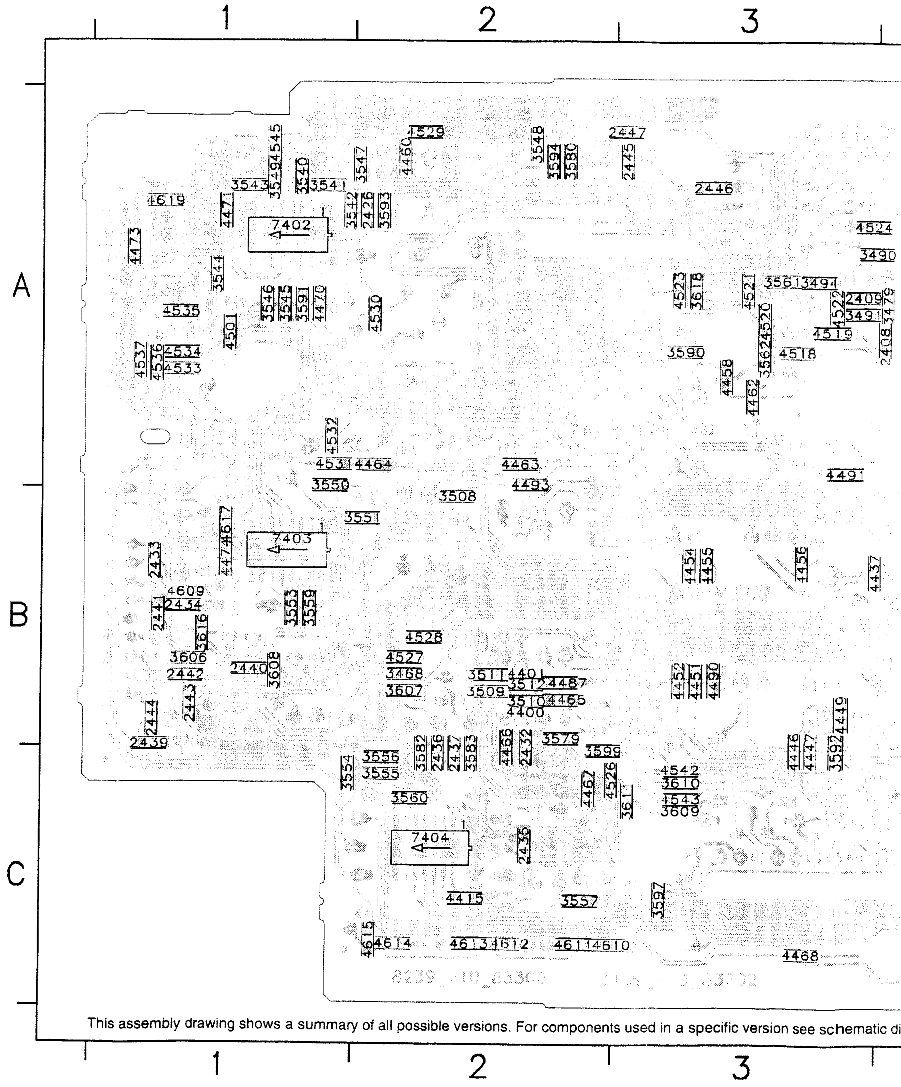
9436	A1	9459	B5	9471	A6	9486	A3	9505	B7	9520	B5	9617	B5	9633	B3	9646	B4
9438	B1	9460	B5	9472	A6	9487	A2	9506	C6	9521	B4	9618	A5	9634	A1	9647	A3
9440	B2	9461	A6	9473	A6	9489	A7	9507	C6	9522	B5	9621	A5	9635	A6	9648	C4
9441	B2	9462	B5	9474	A6	9491	A7	9508	C6	9523	B5	9622	B7	9636	B4	9649	B5
9446	B3	9463	B6	9475	A6	9492	A7	9509	C5	9600	A5	9625	B3	9637	A4	9650	B5
9447	B3	9464	B6	9478	A6	9495	A7	9510	C5	9610	B7	9626	A6	9638	B2		
9451	B4	9465	B6	9479	A6	9496	A7	9511	B1	9611	A7	9627	A5	9639	A1		
9453	B4	9466	B6	9480	A4	9497	B7	9512	B4	9612	C6	9628	A3	9640	C5		
9454	B4	9467	B6	9481	A3	9498	A7	9513	B4	9613	C6	9629	B3	9641	A7		
9455	B4	9468	B6	9483	A3	9499	A7	9515	B4	9614	B4	9630	A5	9642	A6		
9456	A5	9469	B6	9484	A3	9501	B7	9518	C3	9615	B4	9631	B7	9644	C2		
9457	B5	9470	B6	9485	A3	9502	B7	9519	B5	9616	A4	9632	B7	9645	A4		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

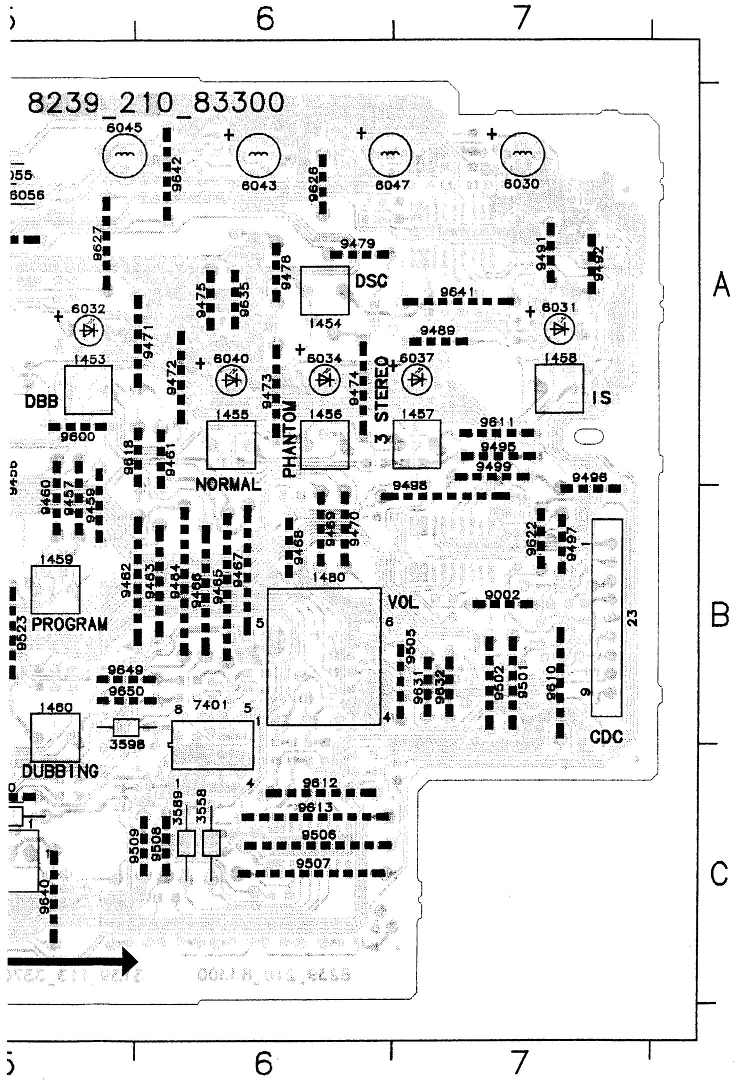
FRONT DISPLAY BOARD - COPPER SIDE VIEW

2400	B6	2420	B7	2442	B1	3413	A6	3443	A5	3460	A5	3497	A4	3529	B7
2401	B6	2421	B6	2443	B1	3417	A6	3444	A5	3461	A5	3498	A4	3530	B7
2402	B6	2422	B6	2444	B1	3418	A6	3445	A5	3463	A5	3499	A4	3531	A7
2403	B6	2423	B7	2445	A3	3419	A6	3446	A5	3464	A5	3505	A7	3532	A7
2404	A6	2425	B7	2446	A3	3420	A6	3447	A5	3466	A5	3506	A7	3534	B6
2405	A5	2426	A2	2447	A3	3421	A6	3448	A5	3467	A5	3507	A7	3535	B6
2407	B6	2431	A5	3400	B5	3422	A6	3449	A5	3468	B2	3508	B2	3536	B7
2408	A4	2432	B2	3401	B5	3432	A6	3450	A5	3470	A5	3509	B2	3537	B7
2409	A3	2433	B1	3402	B5	3433	A6	3451	A5	3474	A6	3510	B2	3538	B7
2410	B6	2434	B1	3403	B5	3435	A6	3452	A5	3475	B5	3511	B2	3539	B6
2411	B7	2435	C2	3404	B5	3436	A6	3453	A5	3478	B6	3512	B2	3540	A1
2412	B7	2436	C2	3405	B5	3437	A6	3454	A5	3479	A4	3521	B7	3541	A1
2415	B7	2437	C2	3406	B6	3438	A6	3455	A5	3490	A3	3522	B7	3542	A1
2416	B7	2438	B7	3407	B6	3439	A5	3456	A5	3491	A3	3525	B7	3543	A1
2417	B7	2439	B1	3408	B6	3440	A5	3457	A5	3492	A7	3526	A7	3544	A1
2418	B7	2440	B1	3410	B6	3441	A5	3458	A5	3494	A3	3527	A7	3545	A1
2419	A7	2441	B1	3411	A6	3442	A5	3459	A5	3496	A4	3528	A7	3546	A1



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic d

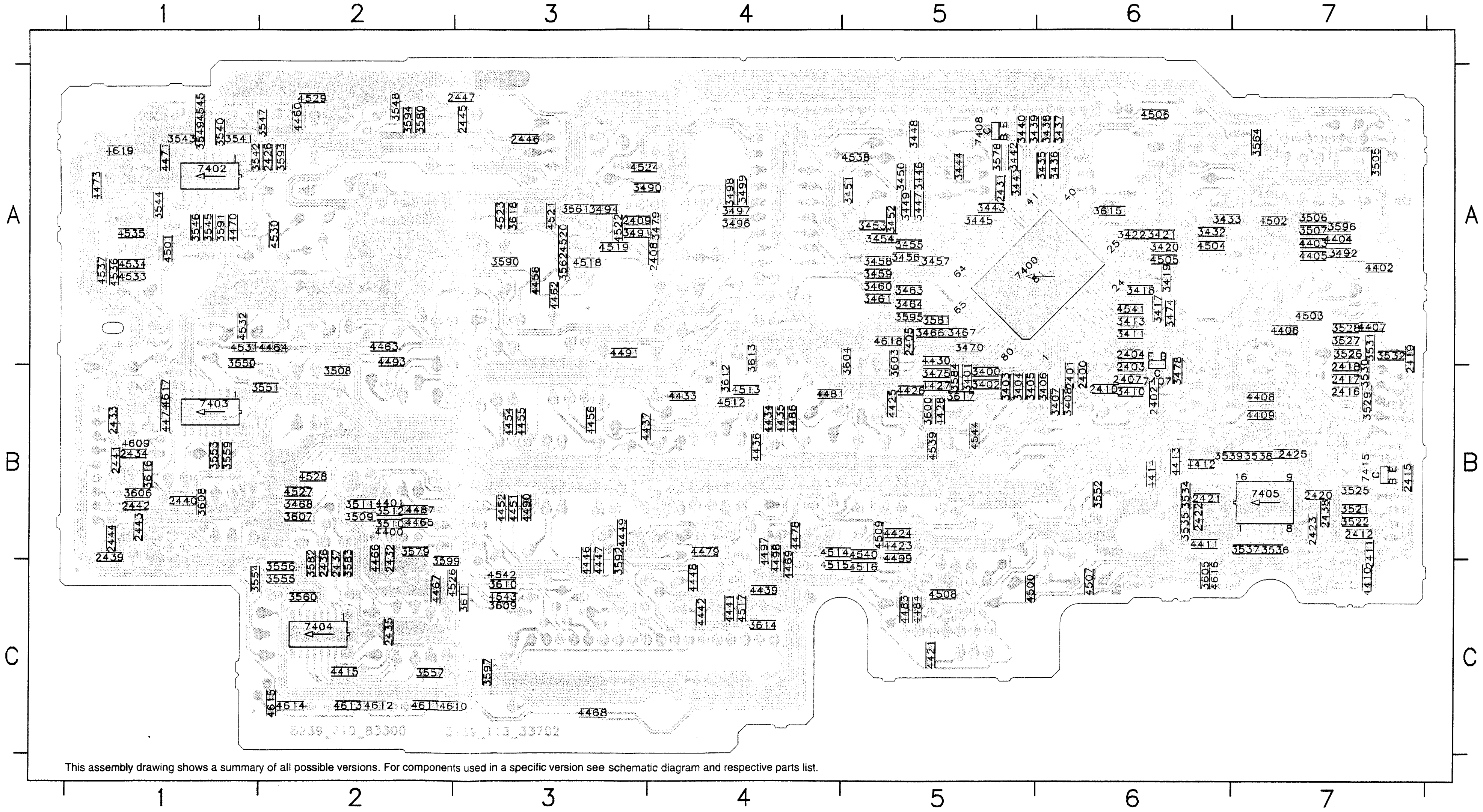
9471	A6	9486	A3	9505	B7	9520	B5	9617	B5	9633	B3	9646	B4
9472	A6	9487	A2	9506	C6	9521	B4	9618	A5	9634	A1	9647	A3
9473	A6	9489	A7	9507	C6	9522	B5	9621	A5	9635	A6	9648	C4
9474	A6	9491	A7	9508	C6	9523	B5	9622	B7	9636	B4	9649	B5
9475	A6	9492	A7	9509	C5	9600	A5	9625	B3	9637	A4	9650	B5
9478	A6	9495	A7	9510	C5	9610	B7	9626	A6	9638	B2		
9479	A6	9496	A7	9511	B1	9611	A7	9627	A5	9639	A1		
9480	A4	9497	B7	9512	B4	9612	C6	9628	A3	9640	C5		
9481	A3	9498	A7	9513	B4	9613	C6	9629	B3	9641	A7		
9483	A3	9499	A7	9515	B4	9614	B4	9630	A5	9642	A6		
9484	A3	9501	B7	9518	C3	9615	B4	9631	B7	9644	C2		
9485	A3	9502	B7	9519	B5	9616	A4	9632	B7	9645	A4		



FRONT DISPLAY BOARD - COPPER SIDE VIEW

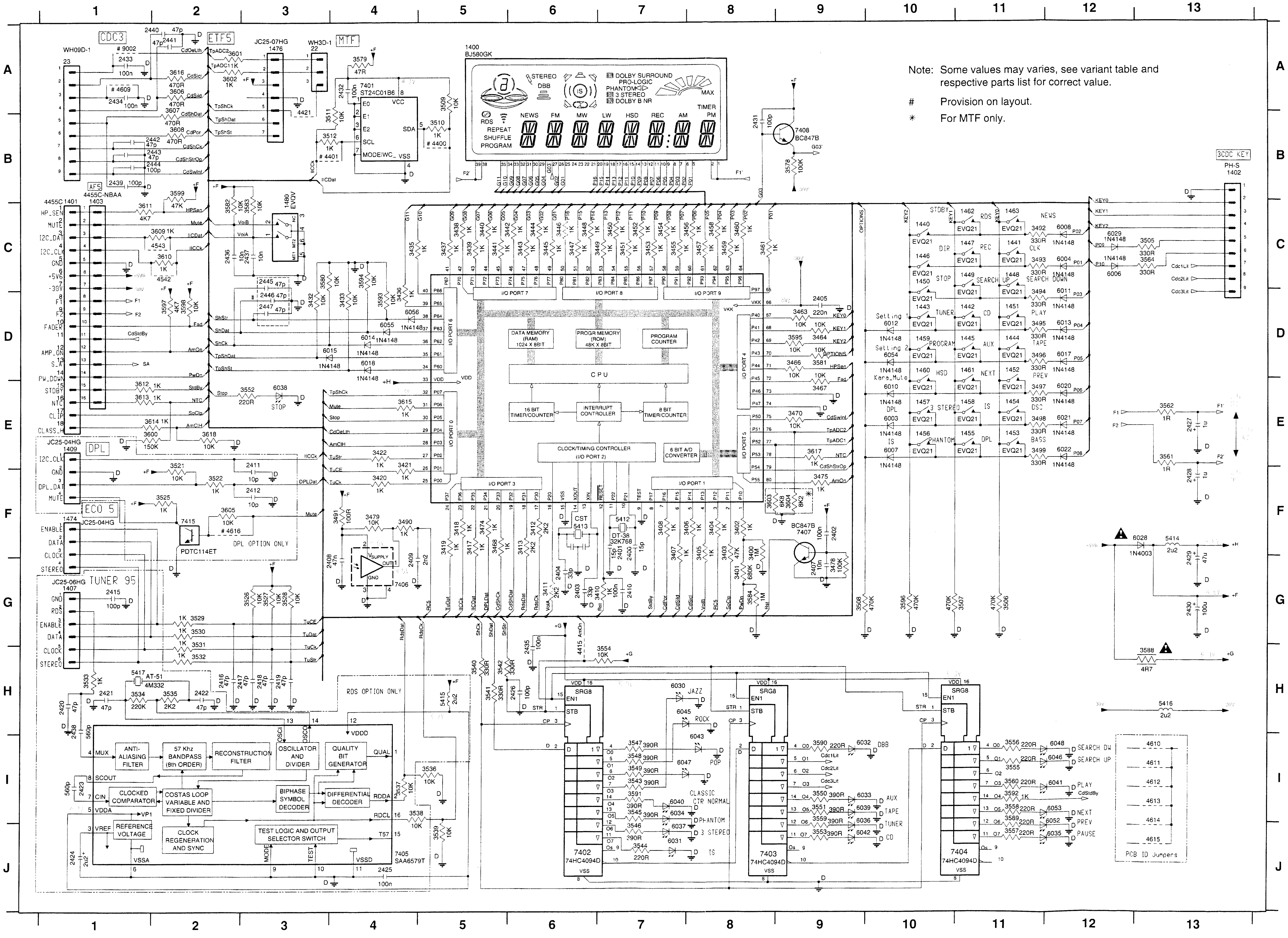
2400	B6	2420	B7	2442	B1	3413	A6	3443	A5	3460	A5	3497	A4	3529	B7	3547	A2	3579	B2
2401	B6	2421	B6	2443	B1	3417	A6	3444	A5	3461	A5	3498	A4	3530	B7	3548	A2	3580	A2
2402	B6	2422	B6	2444	B1	3418	A6	3445	A5	3463	A5	3499	A4	3531	A7	3549	A1	3581	A5
2403	B6	2423	B7	2445	A3	3419	A6	3446	A5	3464	A5	3505	A7	3532	A7	3550	A1	3582	C2
2404	A6	2425	B7	2446	A3	3420	A6	3447	A5	3466	A5	3506	A7	3534	B6	3551	B2	3583	C2
2405	A5	2426	A2	2447	A3	3421	A6	3448	A5	3467	A5	3507	A7	3535	B6	3552	B6	3584	B5
2407	B6	2431	A5	3400	B5	3422	A6	3449	A5	3468	B2	3508	B2	3536	B7	3553	B1	3590	A3
2408	A4	2432	B2	3401	B5	3432	A6	3450	A5	3470	A5	3509	B2	3537	B7	3554	C1	3591	A1
2409	A3	2433	B1	3402	B5	3433	A6	3451	A5	3474	A6	3510	B2	3538	B7	3555	C2	3592	C3
2410	B6	2434	B1	3403	B5	3435	A6	3452	A5	3475	B5	3511	B2	3539	B6	3556	C2	3593	A2
2411	B7	2435	C2	3404	B5	3436	A6	3453	A5	3478	B6	3512	B2	3540	A1	3557	C2	3594	A2
2412	B7	2436	C2	3405	B5	3437	A6	3454	A5	3479	A4	3521	B7	3541	A1	3559	B1	3595	A5
2415	B7	2437	C2	3406	B6	3438	A6	3455	A5	3490	A3	3522	B7	3542	A1	3560	C2	3596	A7
2416	B7	2438	B7	3407	B6	3439	A5	3456	A5	3491	A3	3525	B7	3543	A1	3561	A3	3597	C3
2417	B7	2439	B1	3408	B6	3440	A5	3457	A5	3492	A7	3526	A7	3544	A1	3562	A3	3599	C2
2418	B7	2440	B1	3410	B6	3441	A5	3458	A5	3494	A3	3527	A7	3545	A1	3564	A7	3600	B5
2419	A7	2441	B1	3411	A6	3442	A5	3459	A5	3496	A4	3528	A7	3546	A1	3578	A5	3603	A5

3604	A5	4402	A7	4425	B5	4451	B3	4473	A1	4502	A7	4521	A3	4539	B5	4619	A1
3605	C6	4403	A7	4426	B5	4452	B3	4474	B1	4503	A7	4522	A3	4540	B5	7400	A5
3606	B1	4404	A7	4427	B5	4454	B3	4478	B4	4504	A6	4523	A3	4541	A6	7402	A1
3607	B2	4405	A7	4428	B5	4455	B3	4479	B4	4505	A6	4524	A3	4542	C3	7403	B1
3608	B1	4406	A7	4430	A5	4456	B3	4481	B4	4506	A6	4526	C2	4543	C3	7404	C2
3609	C3	4407	A7	4433	B4	4458	A3	4483	C5	4507	C6	4527	B2	4544	B5	7405	B7
3610	C3	4408	B7	4434	B4	4460	A2	4484	C5	4508	C5	4528	B2	4545	A1	7407	B6
3611	C3	4409	B7	4435	B4	4462	A3	4486	B4	4509	B5	4529	A2	4609	B1	7408	A5
3612	B4	4410	C7	4436	B4	4463	A2	4487	B2	4512	B4	4530	A2	4610	C3	7415	B7
3613	A4	4411	B6	4437	B3	4464	A2	4490	B3	4513	B4	4531	A1	4611	C2		
3614	C4	4412	B6	4439	C4	4465	B2	4491	A3	4514	B4	4532	A1	4612	C2		
3615	A6	4413	B6	4441	C4	4466	B2	4493	A2	4515	C4	4533	A1	4613	C2		
3616	B1	4414	B6	4442	C4	4467	C2	4497	B4	4516	C5	4534	A1	4614	C2		
3617	B5	4415	C2	4446	C3	4468	C3	4498	B4	4517	C4	4535	A1	4615	C2		
3618	A3	4421	C5	4447	C3	4469	C4	4499	B5	4518	A3	4536	A1	4616	C6		
4400	B2	4423	B5	4448	C4	4470	A1	4500	C5	4519	A3	4537	A1	4617	B1		
4401	B2	4424	B5	4449	B3	4471	A1	4501	A1	4520	A3	4538	A5	4618	A5		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CIRCUIT DIAGRAM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A
B
C
D
E
F
G
H
I
J
CDC3
ETF5
MTF
WH09D-1
JC25-07HG
WH3D-1
1400
BJ580GK
STEREO
DBB
DOLBY SURROUND
PRO-LOGIC
PHANTOM
3 STEREO
DOLBY B NR
MAX
TIMER
PM
RDS
REPEAT
SHUFFLE
PROGRAM
NEWS
FM
MW
LW
HSD
REC
AM
7401
ST24C01B6
7408
BC847B
3CDC KEY
PHS
1402
AF5
4455C-NBAA
4455C 1401
1403
HP_SEN
MUTE
I2C_DAT
I2C_CLK
GND
+5V6
-33V
F1
F2
FADER
AMP_ON
S_A
PW_DOWN
STDBY
NTC
CLIP
CLASS_A
1480
EVQV
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024 X 8BIT
PROGR MEMORY (ROM) 48K X 8BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D CONVERTER
JC25-04HG
1409
DPL
ECO 5
1474
ENABLE
DATA
CLOCK
STEREO
7415
PDTC114ET
DPL OPTION ONLY
JC25-06HG
TUNER 95
1407
GND
RDS
7406
CST 5413
5412 DT-38 32K768
BC847B 7407
RDS OPTION ONLY
5417 AT-51 4M332
MUX
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
SCOUT
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
7405 SAA6579T
SRG8
7402 74HC4094D
7403 74HC4094D
7404 74HC4094D
JAZZ
ROCK
POP
CLASSIC
CTR NORMAL
PHANTOM
3 STEREO
IS
DBB
AUX
TAPE
TUNER
CD
SEARCH DW
SEARCH UP
PLAY
NEXT
PREV
PAUSE
PCB ID Jumpers
4610
4611
4612
4613
4614
4615
STDBY
RDS
NEWS
DIR
REC
CLK
STOP
SEARCH UP
SEARCH DOWN
TUNER
CD
PLAY
PROGRAM
AUX
TAPE
HSD
NEXT
PREV
3 STEREO
IS
DSC
PHANTOM
DPL
BASS
Setting
Setting 2
Kara_Mute
6028
1N4003
5414
2u2
3588
4R7
5416
2u2

Note: Some values may varies, see variant table and respective parts list for correct value.

Provision on layout.

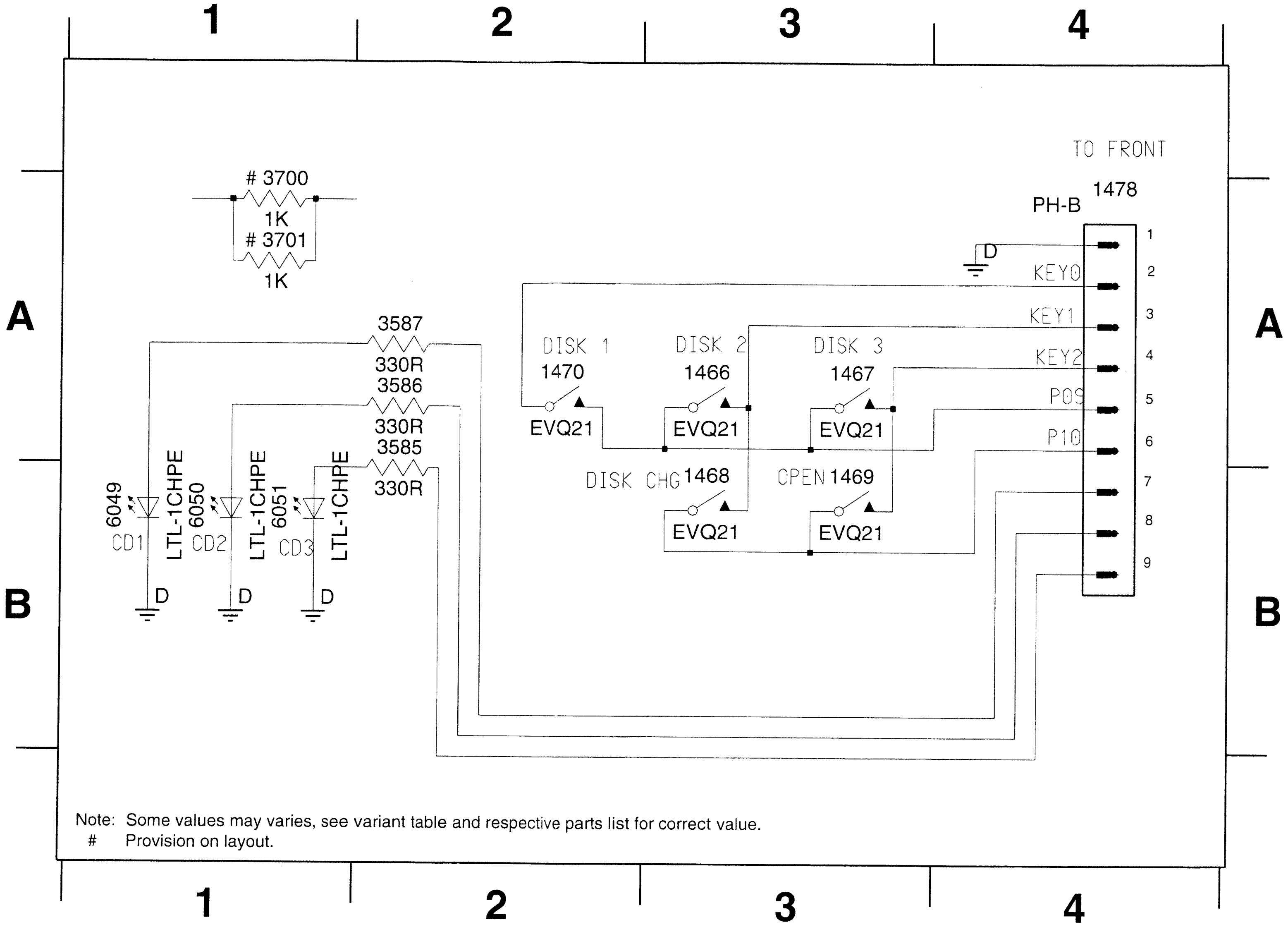
* For MTF only.

22	A3
23	A1
1400	A5
1401	C1
1402	B13
1403	C1
1407	G1
1409	E1
1440	C10
1441	C11
1442	D11
1443	D10
1444	D11
1445	D11
1446	C10
1447	C11
1448	C11
1449	C11
1450	C10
1451	D11
1452	D11
1453	E11
1454	E11
1455	E11
1456	E10
1457	E10
1458	E11
1459	D10
1460	D10
1461	D11
1462	C11
1463	C11
1474	F1
1476	A3
1480	C3
2400	F7
2401	F7
2402	F9
2403	G6
2404	G6
2405	D9
2407	G9
2408	G3
2409	G4
2410	G7
2411	E3
2412	F3
2415	G1
2416	H2
2417	H2
2418	H3
2419	H3
2420	H1
2421	H1
2422	H2
2423	I1
2424	J1
2425	J4
2426	H6
2427	E13
2428	F13
2429	G13
2430	G13
2431	B8
2432	A4
2433	A1
2434	A1
2435	H6
2436	C2
2437	C3
2438	H1
2439	B1
2440	A1
2441	A2
2442	B2
2443	B2
2444	B2
2445	C3
2446	D3
2447	D3
3400	F8
3401	G8
3402	F8
3403	F8
3404	F8
3405	F8
3406	F8
3407	F7
3408	F7
3410	G6
3411	G6
3412	F6
3413	F6
3417	F5
3418	F5
3419	F5
3420	F4
3421	E4
3422	E4
3432	D3
3433	D4
3435	C4
3436	D4
3437	C5
3438	C5
3439	C5
3440	C5
3441	C5
3442	C6
3443	C6
3444	C6
3445	C6
3446	C6
3447	C6
3448	C6
3449	C7
3450	C7
3451	C7
3452	C7
3453	C7
3454	C7
3455	C7
3456	C8
3457	C8
3458	C8
3459	C8
3460	C8
3461	C8
3463	D9
3464	D9
3466	D9
3467	E9
3468	F5
3470	E9
3474	F5
3475	F9
3478	G9
3479	F4
3490	F4
3491	F4
3492	C11
3493	C11
3494	D11
3495	D11
3496	D11
3497	E11
3498	E11
3499	E11
3505	C13
3506	G11
3507	G11
3508	G9
3509	A5
3510	B5
3511	B3
3512	B3
3521	E2
3522	F2
3525	F2
3526	G3
3527	G3
3528	G3
3529	G2
3530	G2
3531	G2
3532	H2
3533	H1
3534	H1
3535	H2
3536	I5
3537	I4
3538	I4
3539	J5
3540	H5
3541	H5
3542	H5
3543	I7
3544	J7
3545	I7
3546	J7
3547	I7
3548	I7
3549	I7
3550	I9
3551	I9
3552	E3
3553	J9
3554	H7
3555	I11
3556	I11
3557	J11
3558	I11
3559	I9
3560	I11
3561	E13
3562	E13
3564	C13
3578	B9
3579	A4
3580	C3
3581	D9
3582	C2
3583	C3
3584	G8
3588	H13
3589	I11
3590	I9
3591	I7
3592	I11
3593	D4
3594	C4
3595	D9
3596	G10
3597	D2
3598	D2
3599	B2
3600	E1
3601	A2
3602	A2
3603	F8
3604	F9
3605	F2
3606	A2
3607	A2
3608	B2
3609	C2
3610	C2
3611	C1
3612	E1
3613	E1
3614	E1
3615	E4
3616	A2
3617	E9
3618	E2
4400	B5
4401	B3
4415	H6
4421	B3
4542	C2
4543	C2
4609	A1
4610	I13
4611	I13
4612	I13
4613	I13
4614	J13
4615	J13
4616	F2
5412	F7
5413	F6
5414	F13
5415	H5
5416	H13
5417	H1
6003	E10
6004	C12
6006	C12
6007	E10
6008	C12
6010	E10
6011	D12
6012	D10
6013	D12
6014	D4
6015	D3
6017	D12
6018	D4
6020	E12
6021	E12
6022	E12
6028	F13
6029	C12
6030	H7
6031	J7
6032	I9
6033	I9
6034	I7
6035	J12
6036	I9
6037	J7
6038	E3
6039	I9
6040	I7
6041	I12
6042	J9
6043	I8
6045	H7
6046	I12
6047	I7
6048	I12
6052	I12
6053	I12
6054	D10
6055	D4
6056	D4
7400	F4
7401	A4
7402	J6
7403	J9
7404	J11
7405	J4
7406	G4
7407	F9
7408	B9
7415	F2
9002	A1

KEY-CDC PART

CIRCUIT DIAGRAM - KEY-CDC PART

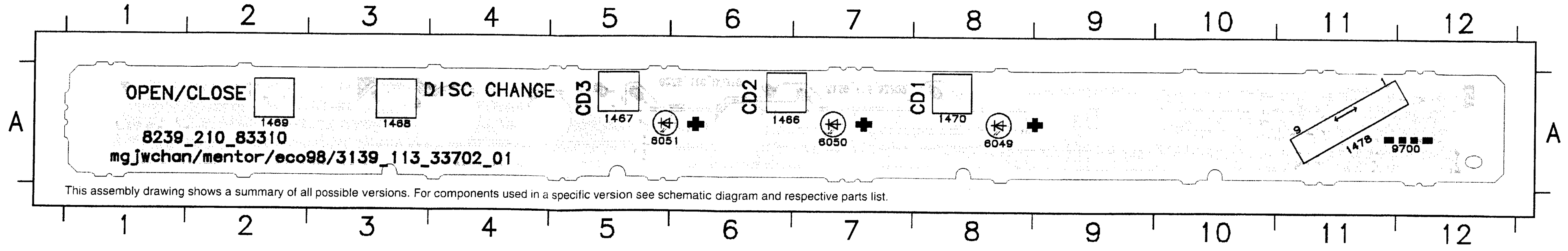
1466 A3	1468 B3	1470 A2	3585 A2	3587 A2	3701 A1	6050 B1
1467 A3	1469 B3	1478 A4	3586 A2	3700 A1	6049 B1	6051 B1


1
2
3
4
A
B
TO FRONT
1478
PH-B
# 3700
1K
# 3701
1K
D
KEY0
KEY1
KEY2
POS
P10
3587
330R
3586
330R
3585
330R
DISK 1
1470
EVQ21
DISK 2
1466
EVQ21
DISK 3
1467
EVQ21
DISK CHG 1468
EVQ21
OPEN 1469
EVQ21
6049
CD1
LTL-1CHPE
6050
CD2
LTL-1CHPE
6051
CD3
LTL-1CHPE
1
2
3
4
5
6
7
8
9

Note: Some values may varies, see variant table and respective parts list for correct value.
# Provision on layout.

KEY-CDC BOARD - COMPONENT VIEW

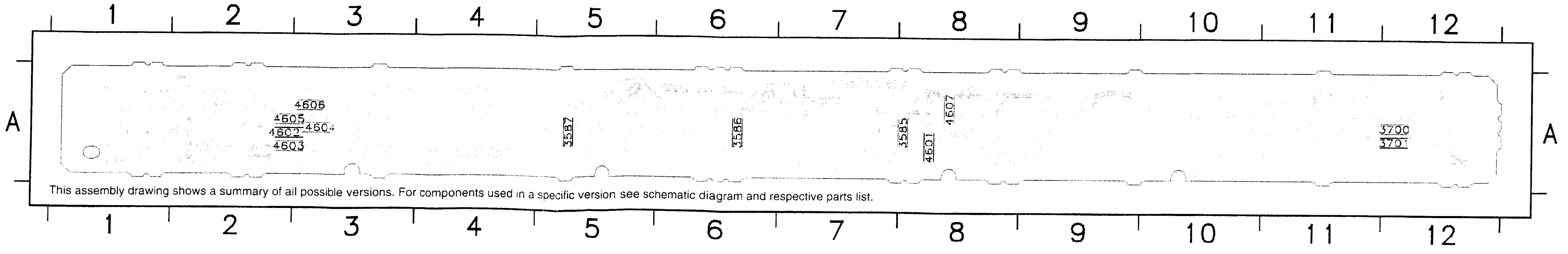
1466 A6	1467 A5	1468 A3	1469 A2	1470 A8	1478 A11	6049 A8	6050 A7	6051 A5	9700 A12


1
2
3
4
5
6
7
8
9
10
11
12
A
OPEN/CLOSE
1469
1468
DISC CHANGE
CD3
1467
6051
CD2
1466
6050
CD1
1470
6049
8239_210_83310
mgjwchan/mentor/eco98/3139_113_33702_01
9
1478
9700

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC BOARD - COPPER SIDE VIEW

3585 A8	3586 A6	3587 A5	3700 A12	3701 A12	4601 A8	4602 A2	4603 A2	4604 A3	4605 A2	4606 A3	4607 A8


1
2
3
4
5
6
7
8
9
10
11
12
A
4606
4605
4602
4604
4603
3587
3586
3585
4601
4607
3700
3701

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	4822 135 00177	FTD Display (Dot Matrix)
1403	4822 267 51238	Connector 16 pins
1440	4822 276 13114	Tact Switch
1441	4822 276 13114	Tact Switch
1442	4822 276 13114	Tact Switch
1443	4822 276 13114	Tact Switch
1444	4822 276 13114	Tact Switch
1445	4822 276 13114	Tact Switch
1446	4822 276 13114	Tact Switch
1447	4822 276 13114	Tact Switch
1448	4822 276 13114	Tact Switch
1449	4822 276 13114	Tact Switch
1450	4822 276 13114	Tact Switch
1451	4822 276 13114	Tact Switch
1452	4822 276 13114	Tact Switch
1453	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1455	4822 276 13114	Tact Switch
1456	4822 276 13114	Tact Switch
1457	4822 276 13114	Tact Switch
1458	4822 276 13114	Tact Switch
1459	4822 276 13114	Tact Switch
1460	4822 276 13114	Tact Switch
1461	4822 276 13114	Tact Switch
1462	4822 276 13114	Tact Switch
1463	4822 276 13114	Tact Switch
1466	4822 276 13114	Tact Switch
1467	4822 276 13114	Tact Switch
1468	4822 276 13114	Tact Switch
1469	4822 276 13114	Tact Switch
1470	4822 276 13114	Tact Switch
1480	4822 101 21261	Rot Encoder 24P

CAPACITORS

2400	4822 122 32504	15pF 2% 50V
2401	4822 122 32504	15pF 2% 50V
2402	4822 126 10002	100nF 20% 25V
2403	5322 122 32659	33pF 5% 50V
2404	5322 122 32659	33pF 5% 50V
2405	4822 126 13473	220nF +80/-20% 50V
2407	4822 122 33177	10nF 20% 50V
2408	4822 126 13751	47nF 10% 63V
2409	4822 122 33175	2,2nF 20% 50V
2410	4822 126 10002	100nF 20% 25V
2411	5322 122 32448	10pF 5% 50V
2412	5322 122 32448	10pF 5% 50V
2415	5322 122 32531	100pF 5% 50V
2416	4822 126 13692	47pF 1% 63V
2417	4822 126 13692	47pF 1% 63V
2418	4822 126 13692	47pF 1% 63V
2419	4822 126 13692	47pF 1% 63V
2420	4822 126 13692	47pF 1% 63V
2421	4822 126 13692	47pF 1% 63V
2422	4822 126 13692	47pF 1% 63V
2423	4822 122 33173	560pF 10% 50V
2424	4822 124 41576	2,2µF 20% 50V
2425	4822 126 13296	100nF 10% 16V
2426	5322 122 32531	100pF 5% 50V
2427	4822 124 40242	1µF 20% 63V
2428	4822 124 40242	1µF 20% 63V
2429	4822 124 80483	47µF 20% 6,3V
2430	4822 124 42446	100µF 20% 10V
2431	5322 122 32531	100pF 5% 50V
2432	4822 126 10002	100nF 20% 25V
2433	4822 126 13296	100nF 10% 16V
2434	4822 126 13296	100nF 10% 16V
2435	4822 126 13296	100nF 10% 16V
2436	4822 122 33177	10nF 20% 50V
2437	4822 122 33177	10nF 20% 50V
2438	4822 122 33173	560pF 10% 50V
2439	5322 122 32531	100pF 5% 50V
2440	4822 126 13692	47pF 1% 63V
2441	4822 126 13692	47pF 1% 63V
2442	4822 126 13692	47pF 1% 63V
2443	4822 126 13692	47pF 1% 63V
2444	5322 122 32531	100pF 5% 50V

RESISTORS

3400	4822 051 20105	1M 5% 0,1W
3401	4822 051 20684	680k 5% 0,1W
3402	4822 051 10102	1k 2% 0,25W
3403	4822 117 10834	47k 1% 0,1W
3404	4822 051 10102	1k 2% 0,25W
3405	4822 051 10102	1k 2% 0,25W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 051 10102	1k 2% 0,25W
3410	4822 051 10102	1k 2% 0,25W
3411	4822 117 11449	2k2 1% 0,1W
3412	4822 116 52256	2k2 5% 0,5W
3413	4822 117 11449	2k2 1% 0,1W
3417	4822 051 10102	1k 2% 0,25W
3418	4822 051 10102	1k 2% 0,25W
3419	4822 051 10102	1k 2% 0,25W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3432	4822 117 10833	10k 1% 0,1W
3433	4822 117 10833	10k 1% 0,1W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W

3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 10102	1k 2% 0,25W
3449	4822 051 10102	1k 2% 0,25W
3450	4822 051 10102	1k 2% 0,25W
3451	4822 051 10102	1k 2% 0,25W
3452	4822 051 10102	1k 2% 0,25W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 051 10102	1k 2% 0,25W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 051 10102	1k 2% 0,25W
3457	4822 051 10102	1k 2% 0,25W
3458	4822 051 10102	1k 2% 0,25W
3459	4822 051 10102	1k 2% 0,25W
3460	4822 051 10102	1k 2% 0,25W
3461	4822 051 10102	1k 2% 0,25W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 117 10833	10k 1% 0,1W
3466	4822 117 10833	10k 1% 0,1W
3467	4822 117 10833	10k 1% 0,1W
3468	4822 051 10102	1k 2% 0,25W
3470	4822 117 10833	10k 1% 0,1W
3474	4822 051 10102	1k 2% 0,25W
3475	4822 051 10102	1k 2% 0,25W
3478	4822 051 20104	100k 5% 0,1W
3479	4822 117 10833	10k 1% 0,1W
3490	4822 051 10102	1k 2% 0,25W
3491	4822 051 20101	100R 5% 0,1W
3492	4822 051 20331	330R 5% 0,1W
3493	4822 116 52219	330R 5% 0,5W
3494	4822 051 20331	330R 5% 0,1W
3495	4822 116 52219	330R 5% 0,5W
3496	4822 051 20331	330R 5% 0,1W
3497	4822 051 20331	330R 5% 0,1W
3498	4822 051 20331	330R 5% 0,1W
3499	4822 051 20331	330R 5% 0,1W
3505	4822 051 20331	330R 5% 0,1W
3506	4822 051 20474	470k 5% 0,1W
3507	4822 051 20474	470k 5% 0,1W
3508	4822 051 20474	470k 5% 0,1W
3509	4822 117 10833	10k 1% 0,1W
3510	4822 051 10102	1k 2% 0,25W
3511	4822 117 10833	10k 1% 0,1W
3512	4822 051 10102	1k 2% 0,25W
3521	4822 117 10833	10k 1% 0,1W
3522	4822 051 10102	1k 2% 0,25W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 117 10833	10k 1% 0,1W
3527	4822 117 10833	10k 1% 0,1W
3528	4822 117 10833	10k 1% 0,1W
3529	4822 051 10102	1k 2% 0,25W
3530	4822 051 10102	1k 2% 0,25W
3531	4822 051 10102	1k 2% 0,25W
3532	4822 051 10102	1k 2% 0,25W
3533	4822 050 11002	1k 1% 0,4W
3534	4822 051 20224	220k 5% 0,1W
3535	4822 117 11449	2k2 1% 0,1W
3536	4822 117 10833	10k 1% 0,1W
3537	4822 117 10833	10k 1% 0,1W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 051 20331	330R 5% 0,1W
3541	4822 051 20331	330R 5% 0,1W
3542	4822 051 20331	330R 5% 0,1W
3543	4822 051 20391	390R 5% 0,1W
3544	4822 117 11503	220R 1% 0.1W
3545	4822 051 20391	390R 5% 0,1W
3546	4822 051 20391	390R 5% 0,1W
3547	4822 051 20391	390R 5% 0,1W
3548	4822 051 20391	390R 5% 0,1W
3549	4822 051 20391	390R 5% 0,1W
3550	4822 051 20391	390R 5% 0,1W
3551	4822 051 20391	390R 5% 0,1W
3552	4822 117 11503	220R 1% 0.1W
3553	4822 051 20391	390R 5% 0,1W
3554	4822 117 10833	10k 1% 0,1W
3555	4822 117 11503	220R 1% 0.1W
3556	4822 117 11503	220R 1% 0.1W
3557	4822 117 11503	220R 1% 0.1W
3558	4822 116 83872	220R 5% 0,5W
3559	4822 051 20391	390R 5% 0,1W
3560	4822 117 11503	220R 1% 0.1W
3561	4822 051 20108	1R 5% 0,1W
3562	4822 051 20108	1R 5% 0,1W
3564	4822 051 20331	330R 5% 0,1W
3578	4822 051 20104	100k 5% 0,1W
3579	4822 051 20479	47R 5% 0,1W
3580	4822 117 10833	10k 1% 0,1W
3581	4822 117 10833	10k 1% 0,1W
3582	4822 117 10833	10k 1% 0,1W
3583	4822 117 10833	10k 1% 0,1W
3584	4822 051 20105	1M 5% 0,1W
3585	4822 051 20331	330R 5% 0,1W
3586	4822 051 20331	330R 5% 0,1W
3587	4822 051 20331	330R 5% 0,1W
3588	4822 052 10478 ⚠	4R7 5% 0,33W
3589	4822 116 83872	220R 5% 0,5W
3590	4822 117 11503	220R 1% 0.1W
3591	4822 051 20391	390R 5% 0,1W
3592	4822 051 10102	1k 2% 0,25W
3593	4822 117 10833	10k 1% 0,1W
3594	4822 117 10833	10k 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3595	4822 117 10833	10k 1% 0,1W
3596	4822 051 20474	470k 5% 0,1W
3597	4822 117 10833	10k 1% 0,1W
3598	4822 116 83864	10k 5% 0,5W
3599	4822 117 10834	47k 1% 0,1W
3600	4822 051 20154	150k 5% 0,1W
3601	4822 050 11002	1k 1% 0,4W
3602	4822 050 11002	1k 1% 0,4W
3606	4822 051 20471	470R 5% 0,1W
3607	4822 051 20471	470R 5% 0,1W
3608	4822 051 20471	470R 5% 0,1W
3609	4822 051 10102	1k 2% 0,25W
3610	4822 051 10102	1k 2% 0,25W
3611	4822 051 20472	4k7 5% 0,1W
3612	4822 051 10102	1k 2% 0,25W
3613	4822 051 10102	1k 2% 0,25W
3614	4822 051 10102	1k 2% 0,25W
3615	4822 051 10102	1k 2% 0,25W
3616	4822 051 20471	470R 5% 0,1W
3617	4822 051 10102	1k 2% 0,25W
3618	4822 117 10833	10k 1% 0,1W
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4404	4822 051 20008	0R Jumper 0805
4405	4822 051 20008	0R Jumper 0805
4406	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4409	4822 051 20008	0R Jumper 0805
4410	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4412	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805
4452	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4458	4822 051 20008	0R Jumper 0805
4460	4822 051 20008	0R Jumper 0805
4462	4822 051 20008	0R Jumper 0805
4463	4822 051 20008	0R Jumper 0805
4464	4822 051 20008	0R Jumper 0805
4465	4822 051 20008	0R Jumper 0805
4466	4822 051 20008	0R Jumper 0805
4467	4822 051 20008	0R Jumper 0805
4468	4822 051 20008	0R Jumper 0805
4469	4822 051 20008	0R Jumper 0805
4470	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4473	4822 051 20008	0R Jumper 0805
4474	4822 051 20008	0R Jumper 0805
4478	4822 051 20008	0R Jumper 0805
4479	4822 051 20008	0R Jumper 0805
4481	4822 051 20008	0R Jumper 0805
4483	4822 051 20008	0R Jumper 0805
4484	4822 051 20008	0R Jumper 0805
4486	4822 051 20008	0R Jumper 0805
4487	4822 051 20008	0R Jumper 0805
4490	4822 051 20008	0R Jumper 0805
4491	4822 051 20008	0R Jumper 0805
4493	4822 051 20008	0R Jumper 0805
4497	4822 051 20008	0R Jumper 0805
4498	4822 051 20008	0R Jumper 0805
4499	4822 051 20008	0R Jumper 0805
4500	4822 051 20008	0R Jumper 0805
4501	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4503	4822 051 20008	0R Jumper 0805
4504	4822 051 20008	0R Jumper 0805
4505	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805
4507	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD

4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4604	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4610	4822 051 20008	0R Jumper 0805
4611	4822 051 20008	0R Jumper 0805
4612	4822 051 20008	0R Jumper 0805
4613	4822 051 20008	0R Jumper 0805
4614	4822 051 20008	0R Jumper 0805
4615	4822 051 20008	0R Jumper 0805
4616	4822 051 20008	0R Jumper 0805
4617	4822 051 20008	0R Jumper 0805
4618	4822 051 20008	0R Jumper 0805
4619	4822 051 20008	0R Jumper 0805

COIL & FILTERS

5412	4822 242 70938	X'tal Resonator 32,768kHz
5413	4822 242 72066	Ceramic Resonator
5414	4822 157 11477	Fixed Inductor 2µ2 5%
5415	4822 157 11477	Fixed Inductor 2µ2 5%
5416	4822 157 11477	Fixed Inductor 2µ2 5%
5417	4822 242 72195	QUARZ 4,332 MHz

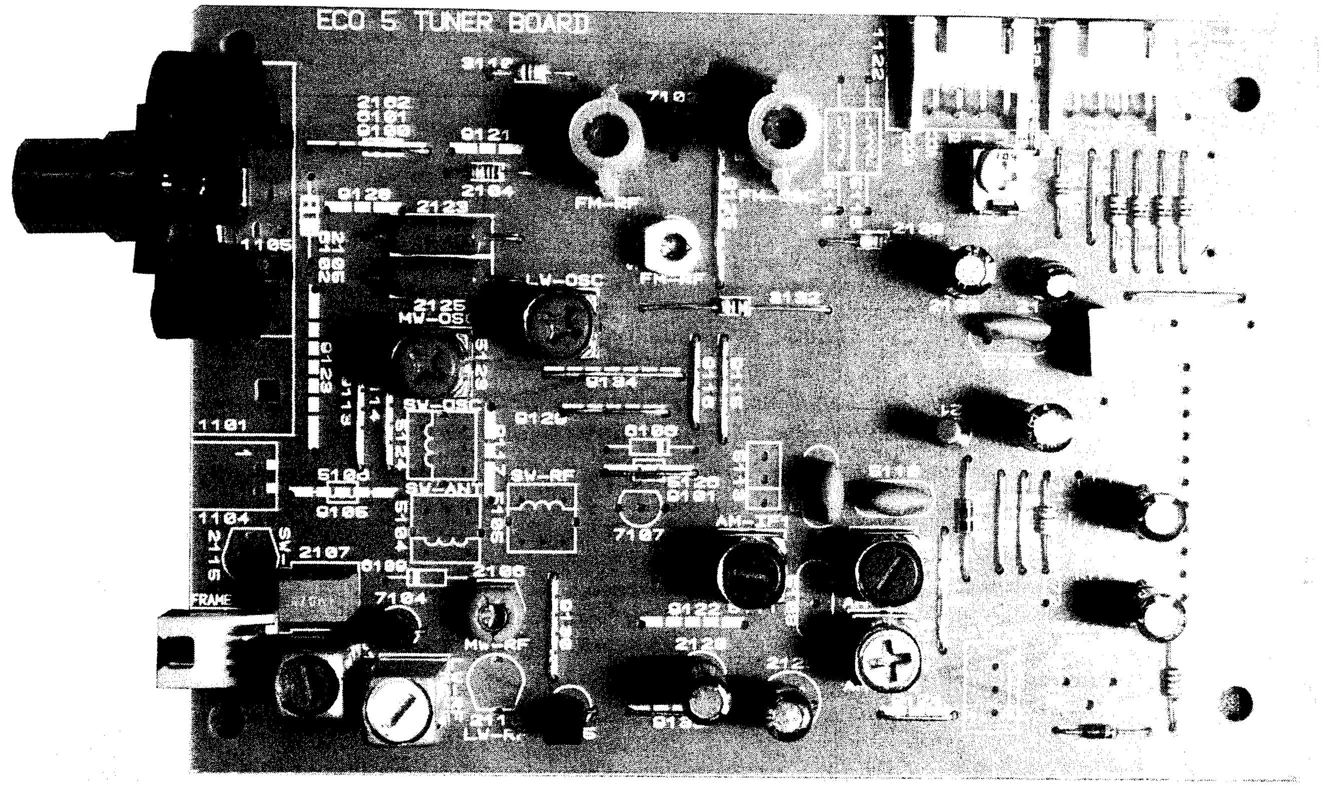
DIODES

6004	4822 130 30621	1N4148
6006	4822 130 30621	1N4148
6008	4822 130 30621	1N4148
6010	4822 130 30621	1N4148
6011	4822 130 30621	1N4148
6013	4822 130 30621	1N4148
6014	4822 130 30621	1N4148
6015	4822 130 30621	1N4148
6017	4822 130 30621	1N4148
6018	4822 130 30621	1N4148
6020	4822 130 30621	1N4148
6021	4822 130 30621	1N4148
6022	4822 130 30621	1N4148
6028	4822 130 31878	⚠ 1N4003G
6029	4822 130 30621	1N4148
6030	4822 130 83119	LTL-307C
6031	4822 130 10791	LTL-1CHGE
6032	4822 130 10791	LTL-1CHGE
6033	4822 130 10792	LTL-1CHPE
6034	4822 130 10792	LTL-1CHPE
6035	4822 130 10791	LTL-1CHGE
6036	4822 130 10792	LTL-1CHPE
6037	4822 130 10792	LTL-1CHPE
6038	4822 130 10791	LTL-1CHGE
6039	4822 130 10792	LTL-1CHPE
6040	4822 130 10792	LTL-1CHPE
6041	4822 130 10791	LTL-1CHGE
6042	4822 130 10792	LTL-1CHPE
6043	4822 130 83119	LTL-307C
6045	4822 130 83119	LTL-307C
6046	4822 130 10791	LTL-1CHGE
6047	4822 130 83119	LTL-307C
6048	4822 130 10791	LTL-1CHGE
6049	4822 130 10792	LTL-1CHPE
6050	4822 130 10792	LTL-1CHPE
6051	4822 130 10792	LTL-1CHPE
6052	4822 130 10791	LTL-1CHGE
6053	4822 130 10791	LTL-1CHGE
6055	4822 130 30621	1N4148
6056	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7400	4822 209 16489	TMP87CS71F - '775S51721'
7401	4822 209 31508	ST24C01B6
7402	4822 209 15449	74HC4094D
7403	4822 209 15449	74HC4094D
7404	4822 209 15449	74HC4094D
7405	4822 209 31981	SAA6579T
7406	4822 130 10165	GP1U28XP
7407	4822 130 60511	BC847B
7408	4822 130 60511	BC847B
7415	4822 130 11155	PDTC114ET

Note: Only the parts mentioned in this list are normal service spare parts.

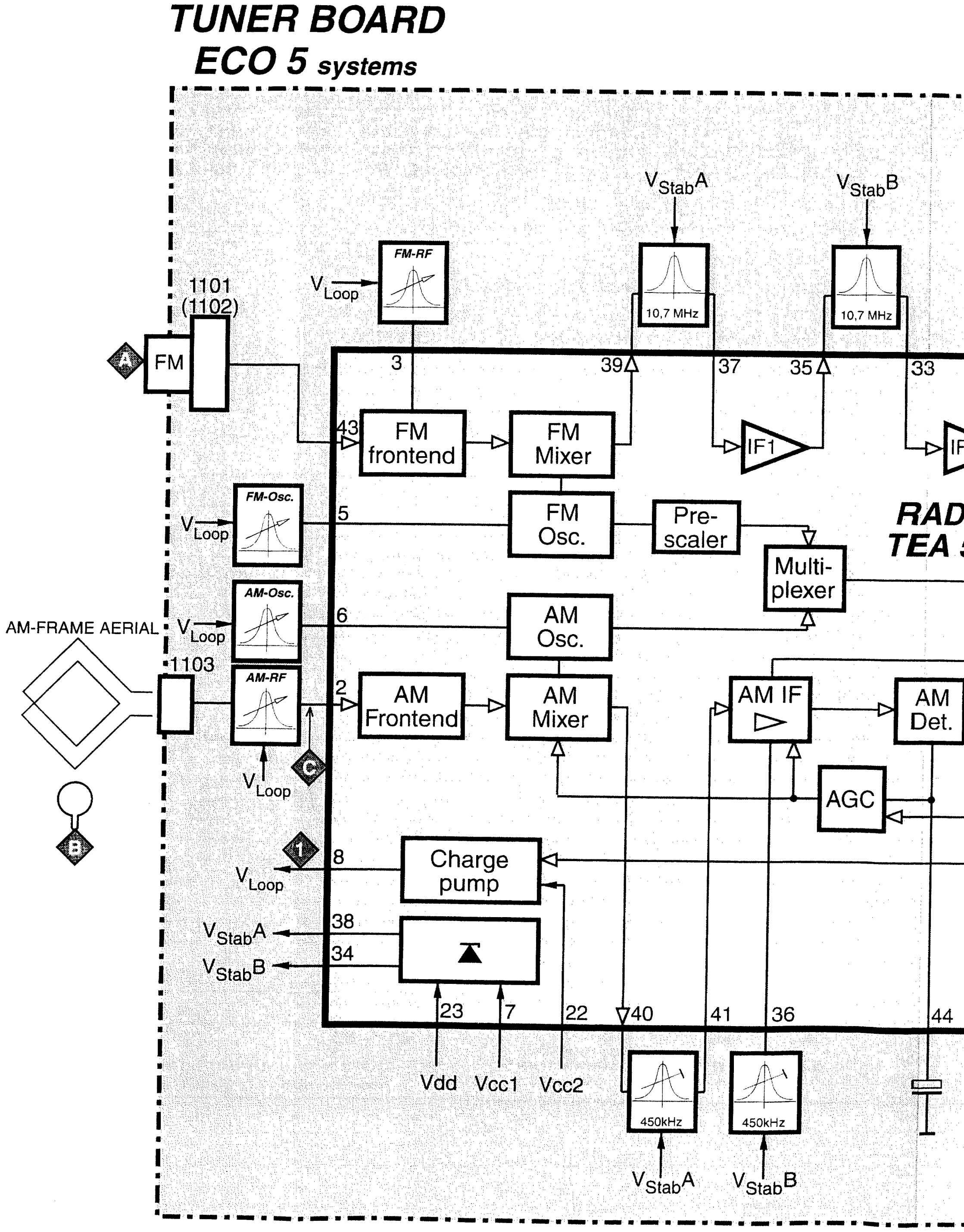

ECO 5 TUNER BOARD
1101
1104
1105
FRAME
7101
7104
7107
FM-RF
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
AM-RF
MW-RF
LW-RF

TUNER BOARD ECO5

TABLE OF CONTENTS

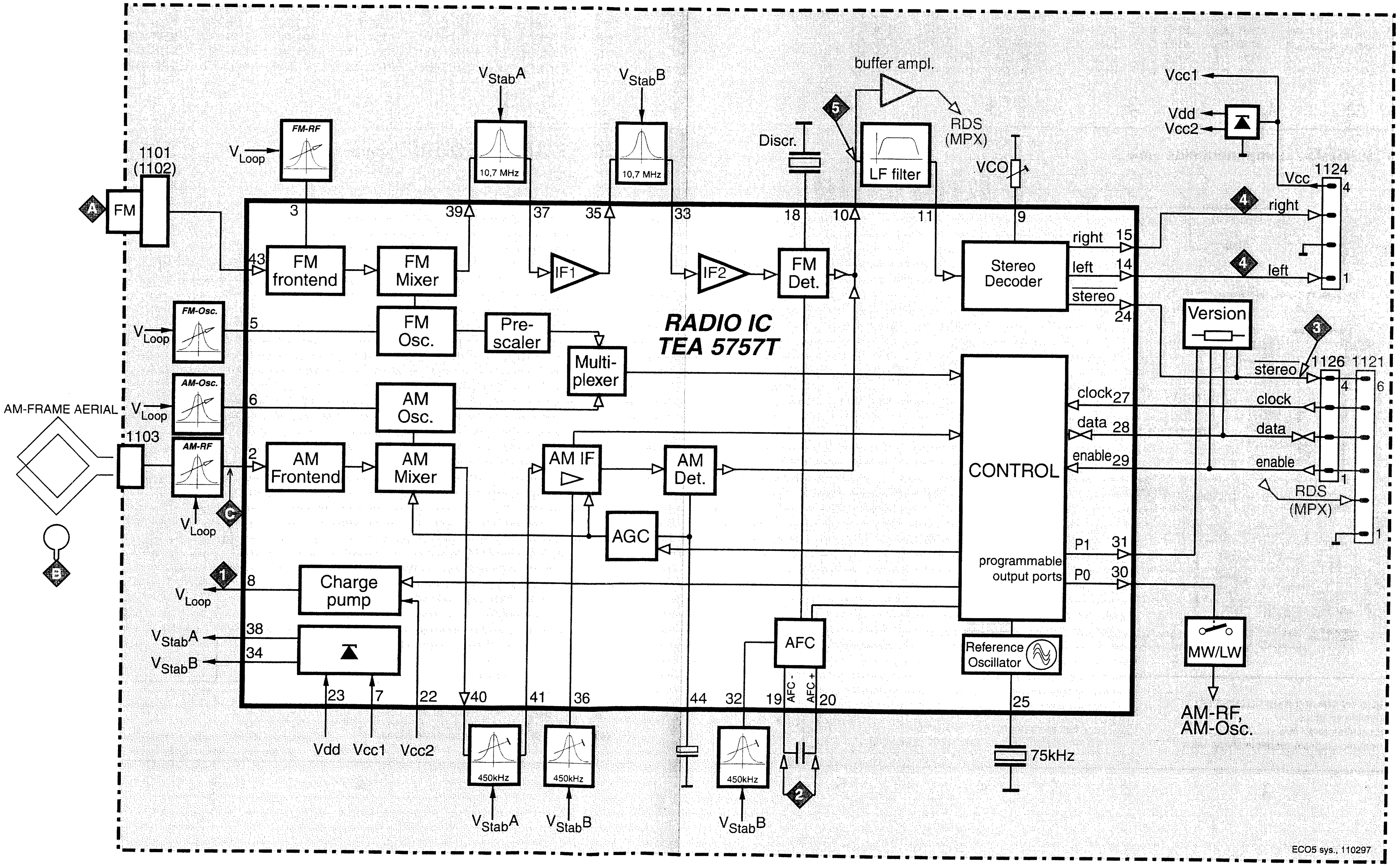
Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout 7B-2
Circuit diagram 7B-3
Partslist 7B-4

BLOCKDIAGRAM

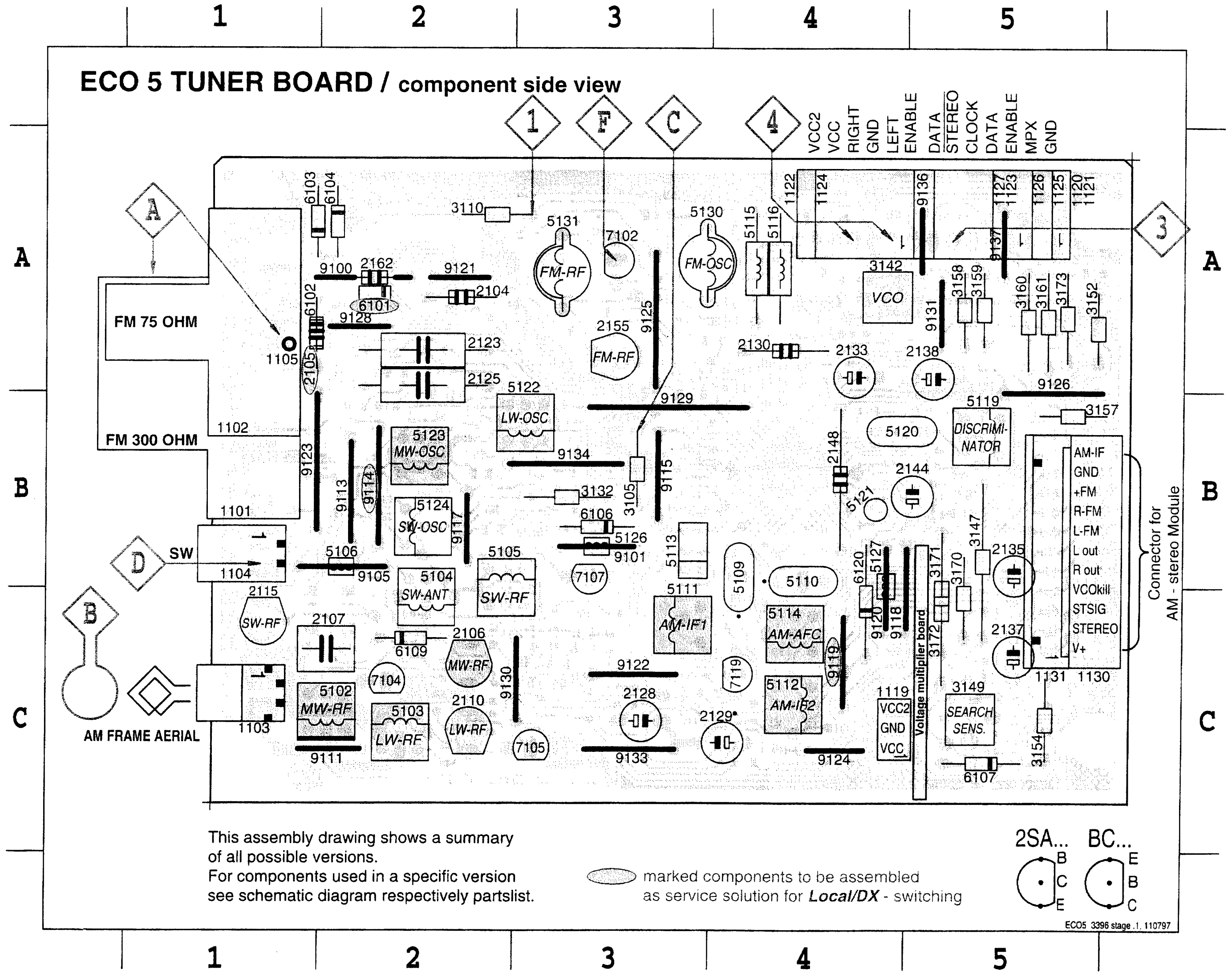

TUNER BOARD
ECO 5 systems
$V_{Stab}A$
$V_{Stab}B$
10,7 MHz
10,7 MHz
FM-RF
V_{Loop}
1101
(1102)
A
FM
3
39
37
35
33
43
FM frontend
FM Mixer
IF1
IF
FM-Osc.
5
FM Osc.
Pre-scaler
Multi-plexer
RAD
TEA
AM-Osc.
AM-FRAME AERIAL
6
AM Osc.
1103
AM-RF
2
AM Frontend
AM Mixer
AM IF
AM Det.
C
AGC
B
1
8
Charge pump
38
34
23
7
22
40
41
36
44
Vdd
Vcc1
Vcc2
450kHz
450kHz

BLOCKDIAGRAM

TUNER BOARD
ECO 5 systems


RADIO IC
TEA 5757T
FM
1101
(1102)
FM-RF
V Loop
FM frontend
FM Mixer
FM Osc.
FM-Osc.
Pre-scaler
Multi-plexer
AM-FRAME AERIAL
1103
AM-Osc.
AM-RF
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
Charge pump
V StabA
V StabB
10,7 MHz
10,7 MHz
IF1
IF2
FM Det.
Discr.
buffer ampl.
RDS (MPX)
LF filter
VCO
Stereo Decoder
CONTROL
programmable output ports
Reference Oscillator
AFC
AFC -
AFC +
75kHz
450kHz
450kHz
450kHz
Vdd
Vcc1
Vcc2
Vcc
1124
right
left
stereo
Version
1126
1121
clock
data
enable
RDS (MPX)
P1
P0
MW/LW
AM-RF, AM-Osc.
43
3
5
6
2
8
38
34
23
7
22
40
41
36
44
32
19
20
25
39
37
35
33
18
10
11
9
15
14
24
27
28
29
31
30
4
1
4
1
6
1
A
B
C
1
2
3
4
4
5
ECO5 sys., 110297

1101	A1	2106	C2	2137	C5	3149	C5	3173	A5	5114	C4	5130	A3	7104	C2	9117	B2	9129	B3
1102	A1	2107	C2	2138	A5	3152	A5	5102	C2	5115	A4	5131	A3	7105	C3	9118	B4	9130	C3
1103	C1	2110	C2	2144	B5	3154	C5	5103	C2	5116	A4	6101	A2	7107	B3	9119	C4	9131	A5
1104	B1	2115	C1	2148	B4	3157	B5	5104	C2	5119	B5	6102	A1	7119	C4	9120	B4	9133	C3
1105	A1	2123	A2	2155	A3	3158	A5	5105	B2	5120	B4	6103	A1	9100	A2	9121	A2	9134	B3
1119	C5	2125	A2	2162	A2	3159	A5	5106	B2	5121	B4	6104	A2	9101	B3	9122	C3	9136	A5
1120	A5	2128	C3	3105	B3	3160	A5	5109	B4	5122	B3	6106	B3	9105	B2	9123	B1	9137	A5
1130	B5	2129	C4	3110	A2	3161	A5	5110	B4	5123	B2	6107	C5	9111	C2	9124	C4		
1131	B5	2130	A4	3132	B3	3170	C5	5111	C3	5124	B2	6109	C2	9113	B2	9125	A3		
2104	A2	2133	A4	3142	A4	3171	C5	5112	C4	5126	B3	6120	C4	9114	B2	9126	B5		
2105	A1	2135	B5	3147	B5	3172	C5	5113	B3	5127	B4	7102	A3	9115	B3	9128	A2		

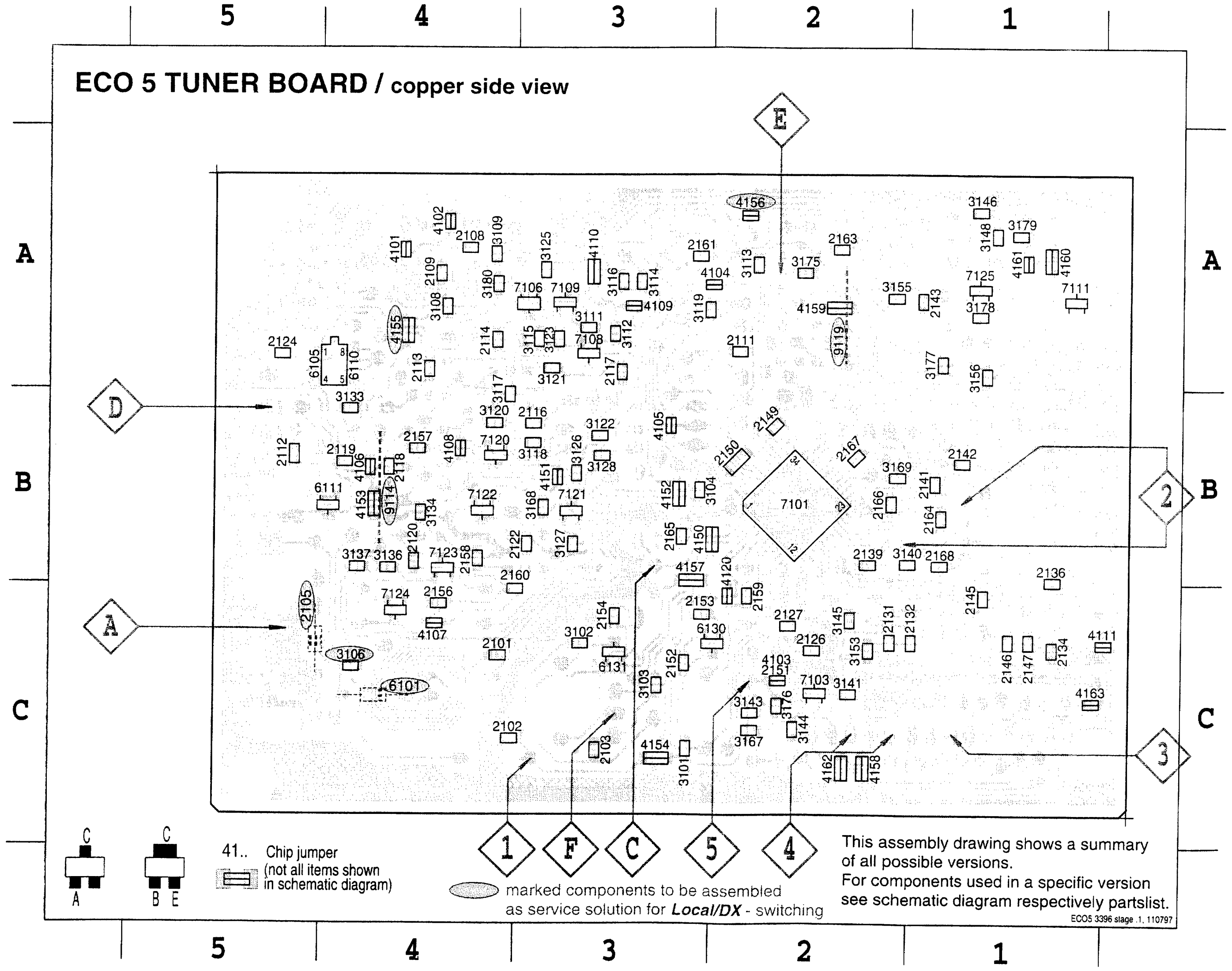

1
2
3
4
5
A
B
C
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
1101
1102
1103
1104
1105
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
DISCRIMI-NATOR
SEARCH SENS.
Voltage multiplier board
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
VCC2
GND
VCC
Connector for AM - stereo Module
2SA...
BC...
B
C
E
ECO5 3396 stage .1. 110797

ECO 5 TUNER BOARD / component side view

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for *Local/DX* - switching

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4106	B4	4154	C3	6110	A4	7121	B3
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4107	C4	4155	A4	6111	B4	7122	B4
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4108	B4	4156	A2	6130	C2	7123	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4109	A3	4157	B3	6131	C3	7124	C4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4110	A3	4158	C2	7101	B2	7125	A1
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4111	C1	4159	A2	7103	C2		
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	4101	A4	4120	C2	4160	A1	7106	A3		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4102	A4	4150	B2	4161	A1	7108	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4103	C2	4151	B3	4162	C1	7109	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4104	A2	4152	B3	4163	C1	7111	A1		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4105	B3	4153	B4	6105	A4	7120	B4		


5
4
3
2
1
A
B
C
E
D
A
1
F
C
5
4
2
3
7101
A
B E
C
41..
ECO5 3396 stage .1. 110797

ECO 5 TUNER BOARD / copper side view

Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for *Local/DX* - switching

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

TUNER A

Wavera
VARICAP
FM 87.5 - 108 (65.81 - 74, 87.5
MW FM/AM-version, 1 530 - 170
FM/MW-version, 531 - 160
LW 153 - 279k
MW FM/MW/LW- vers 531 - 1602
FM IF
FM
FM RF
FM 87.5 - 108 (65.81 - 74, 87.5
VCO
FM
AM IF
MW
AM AFC **MW**
AM RF 3)
MW 4) FM/MW/LW- and FM/ (9kHz gri 531 - 1602
LW
MW FM/AM-version, 10 530 - 1700k

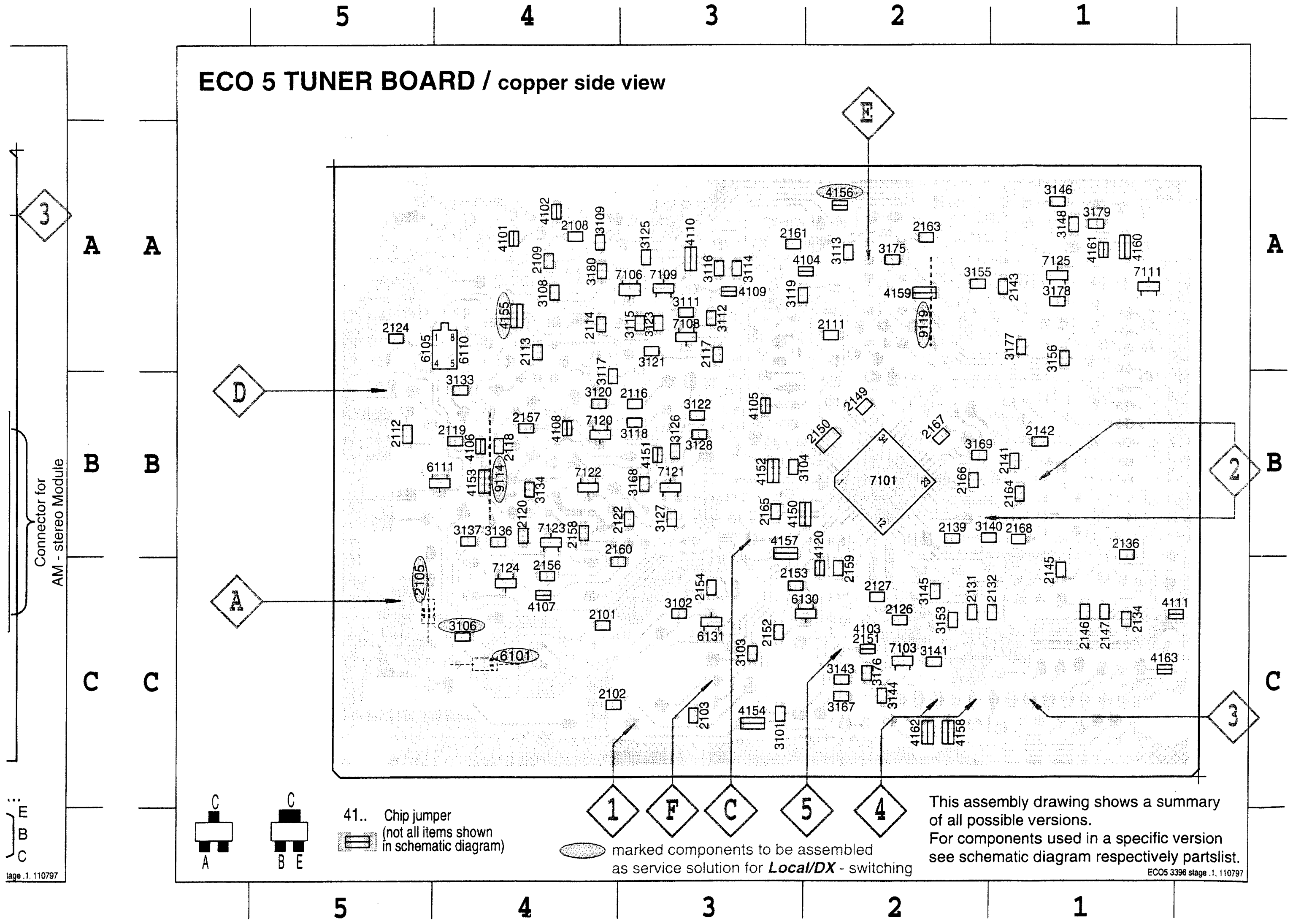
Use service test p

1) If sensitivity of f (input signal: ste

3) For AM RF adju

↕ Repeat

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4106	B4	4154	C3	6110	A4	7121	B3
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4107	C4	4155	A4	6111	B4	7122	B4
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4108	B4	4156	A2	6130	C2	7123	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4109	A3	4157	B3	6131	C3	7124	C4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4110	A3	4158	C2	7101	B2	7125	A1
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4111	C1	4159	A2	7103	C2		
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	4101	A4	4120	C2	4160	A1	7106	A3		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4102	A4	4150	B2	4161	A1	7108	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4103	C2	4151	B3	4162	C1	7109	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4104	A2	4152	B3	4163	C1	7111	A1		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4105	B3	4153	B4	6105	A4	7120	B4		



ECO 5 TUNER BOARD / copper side view

41.. Chip jumper (not all items shown in schematic diagram)

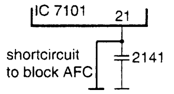
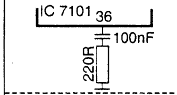
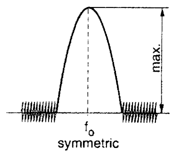
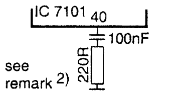
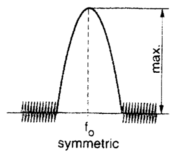
marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

ECO5 3396 stage .1. 110797

stage .1. 110797

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F	 IC 7101 21 shortcircuit to block AFC 2141	5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX ↕
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV	 IC 7101 36 100nF 220R	5111	4	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	4	 max. f_o symmetric ↕
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		↕
	560kHz		560kHz	5102		

ECO5. discr. coil. 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

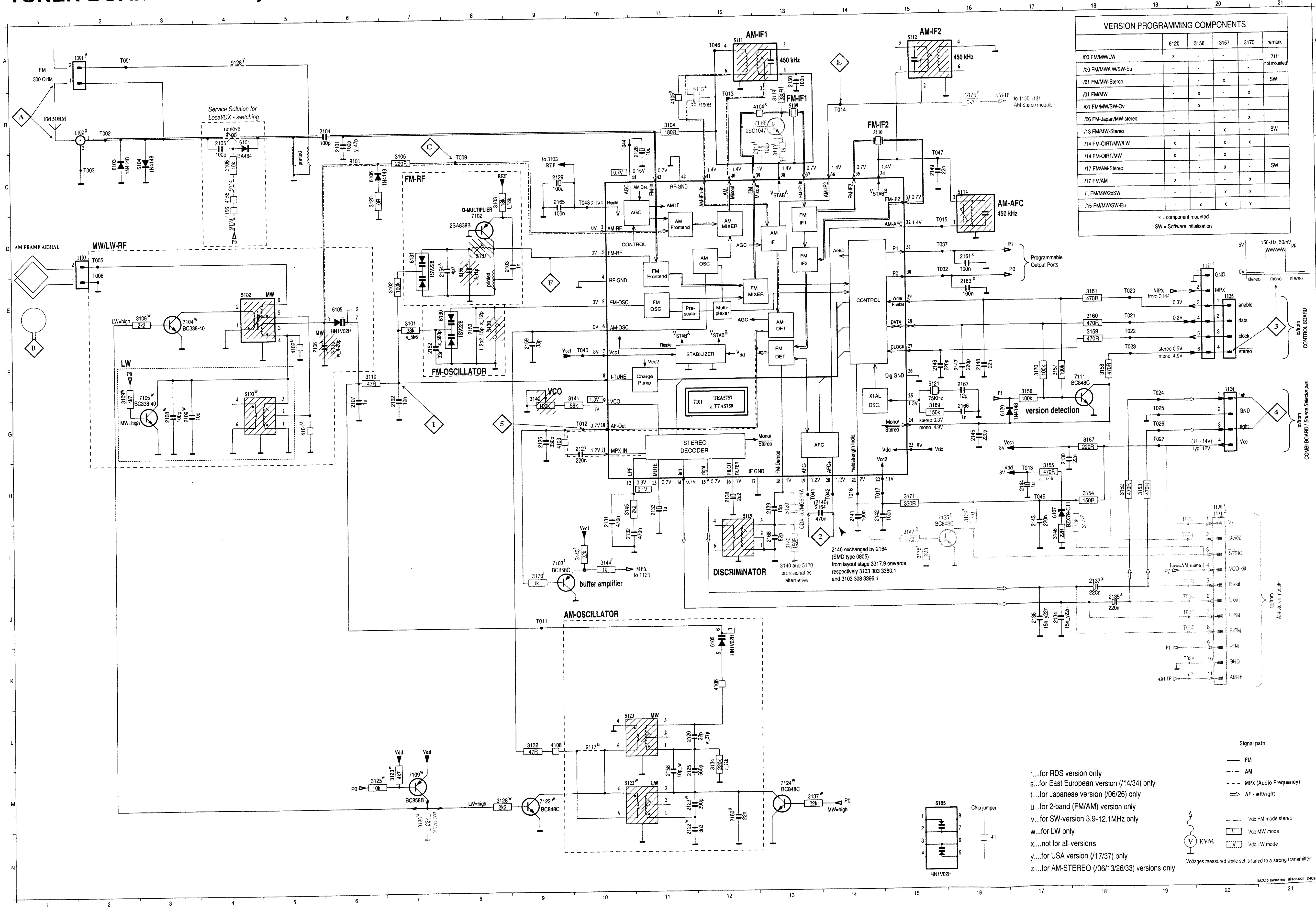
2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

4) MW has to be aligned before LW.

↕ Repeat

TUNER BOARD ECO5 / Systems


FM
300 OHM
FM 50OHM
1101
1102
T001
T002
T003
9128
Service Solution for
Local/DX - switching
remove
9100
2105
6101
100p
BA484
2104
100p
2101
printed
9101
3105
220R
T009
FM-RF
REF
Q-MULTIPLIER
7102
2SA838B
6103
1N4148
6104
1N4148
6106
1N4148
3120
0R
AM FRAME AERIAL
MW/LW-RF
1103
T005
T006
5102
MW
3108
2k2
LW=high
7104
BC338-40
6105
HN1V02H
LW
7105
BC338-40
MW=high
5103
3110
47R
FM-OSCILLATOR
6130
6131
1SV228
3101
33k
3102
100k
to 3103
REF
AM-IF1
5111
450 kHz
T046
T013
5113
SFU450B
4105
FM-IF1
5109
4104
7119
2SC1047
3104
180R
AM-IF2
5112
450 kHz
3175
2k7
AM-IF
to 1130,1131
AM-Stereo module
T014
FM-IF2
5110
T047
2149
22n
5114
AM-AFC
450 kHz
T015
AGC
AM Det
FM-In
RF-GND
AM IF
AM Frontend
AM MIXER
AM IF
FM IF1
FM IF2
CONTROL
FM Frontend
FM OSC
Pre-scaler
Multi-plexer
FM MIXER
AM OSC
AM DET
FM DET
STABILIZER
Charge Pump
XTAL OSC
STEREO DECODER
AFC
7101
TEA5757
TEA5759
0V AM-RF
0V FM-RF
RF-GND
0V FM-OSC
0V AM-OSC
Vcc1
T040
8V
I-TUNE
VCO
3142
100k
3141
56k
1.3V
1V
T012
0.7V
AF-Out
MPX-IN
2127
220n
T043
2.1V
Ripple
P1
P0
T037
2161
100n
T032
2163
100n
Programmable
Output Ports
Write Enable
DATA
CLOCK
Dig.GND
Mono/Stereo
5121
75KHz
3169
150k
2166
1n
2167
12p
P1
3156
100k
6120
1N4148
version detection
7111
BC848C
3161
470R
T020
MPX
from 3144
3160
470R
T021
3159
470R
T022
T023
stereo 0.5V
mono 4.9V
1121
GND
MPX
1126
enable
data
clock
stereo
to/from
CONTROL BOARD
5V
150kHz, 50mVpp
0V
stereo
mono
stereo
1124
left
GND
right
Vcc
T024
T025
T026
T027
(11 - 14V)
typ. 12V
to/from
COMBI BOARD / Source Selector part
3167
220R
Vcc1
8V
Vdd
T018
3155
470R
2130
22n
2144
3154
150R
T045
6107
BZX79-C11
3146
22R
3171
330R
7125
BC848C
3147
3177
3178
2143
220n
3152
470R
3153
470R
1130
1131
V+
stereo
STSIG
VCO-kill
R-out
L-out
L-FM
R-FM
+FM
GND
AM-IF
LoweAM mute
to/from
AM-stereo module
2137
220n
2135
220n
2136
15n_y22n
2134
15n_y22n
LPF
MUTE
left
right
PILOT FILTER
IF GND
FM-Demod
AFC
AFC+
Fieldstrength Indic.
Vdd
Vcc2
2131
470n
3145
2k2
2132
470n
2133
2138
2k2
2139
5119
DISCRIMINATOR
2168
5120
CDA10.7MG46
3140
150R
2140
2164
470n
3140 and 5120
provisional se
alternative
2140 exchanged by 2164
(SMD type 0805)
from layout stage 3317.9 onwards
respectively 3103 303 3380.1
and 3103 308 3396.1
T016
T017
2141
100n
2142
100n
Vcc1
3143
22k
3144
1k
MPX
to 1121
7103
BC858C
3176
1k
buffer amplifier
2126
2125
4103
AM-OSCILLATOR
T011
6105
HN1V02H
4106
5123
MW
3132
47R
4108
9117
2120
2158
10p_w
2125
560p
3134
220k
5122
LW
2123
390p
2122
3n3
2160
22n
7124
BC848C
3137
22k
P0
MW=high
7109
BC858B
3125
10k
3123
4k7
3180
22k
Vdd
LW=high
3128
2k2
7122
BC848C
6105
HN1V02H
Chip jumper
41..
Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right
EVM
Vdc FM mode stereo
Vdc MW mode
Vdc LW mode
Voltages measured while set is tuned to a strong transmitter
ECO5 systems, discr.coil. 240997

VERSION PROGRAMMING COMPONENTS	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted

SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20224	220k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805 5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W 5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

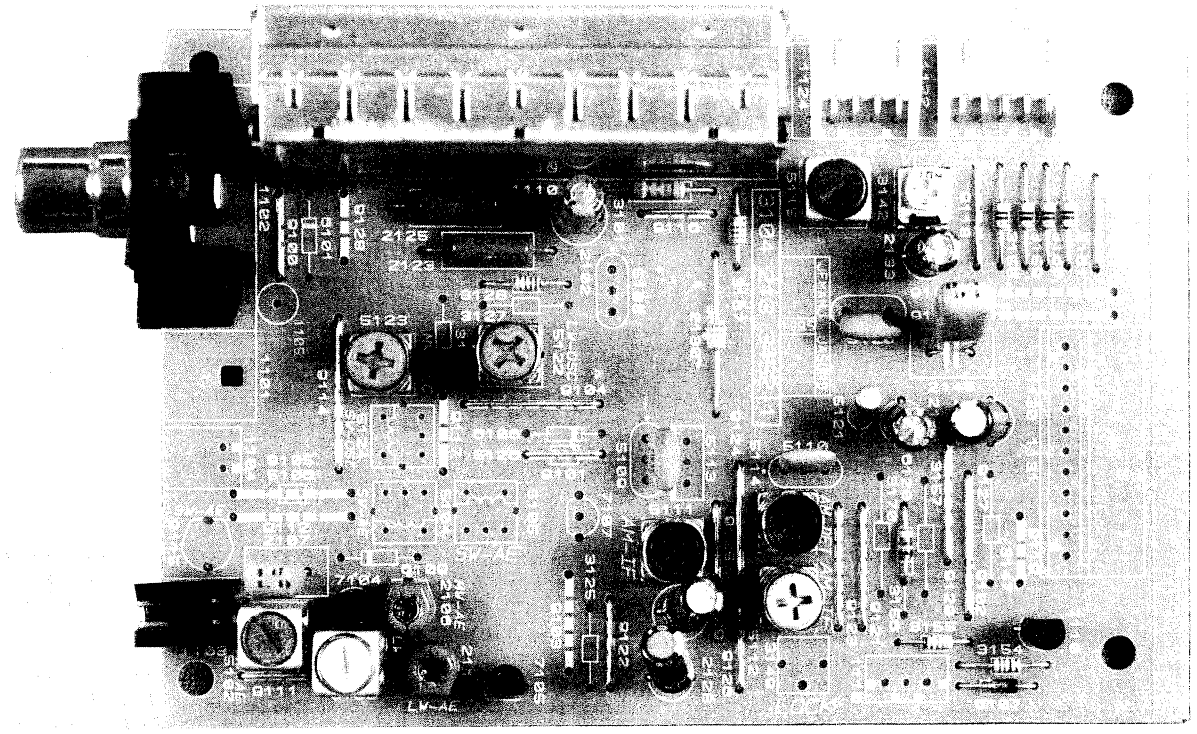
DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.



TUNER 95 BOARD

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Adjustmant table 7D-2
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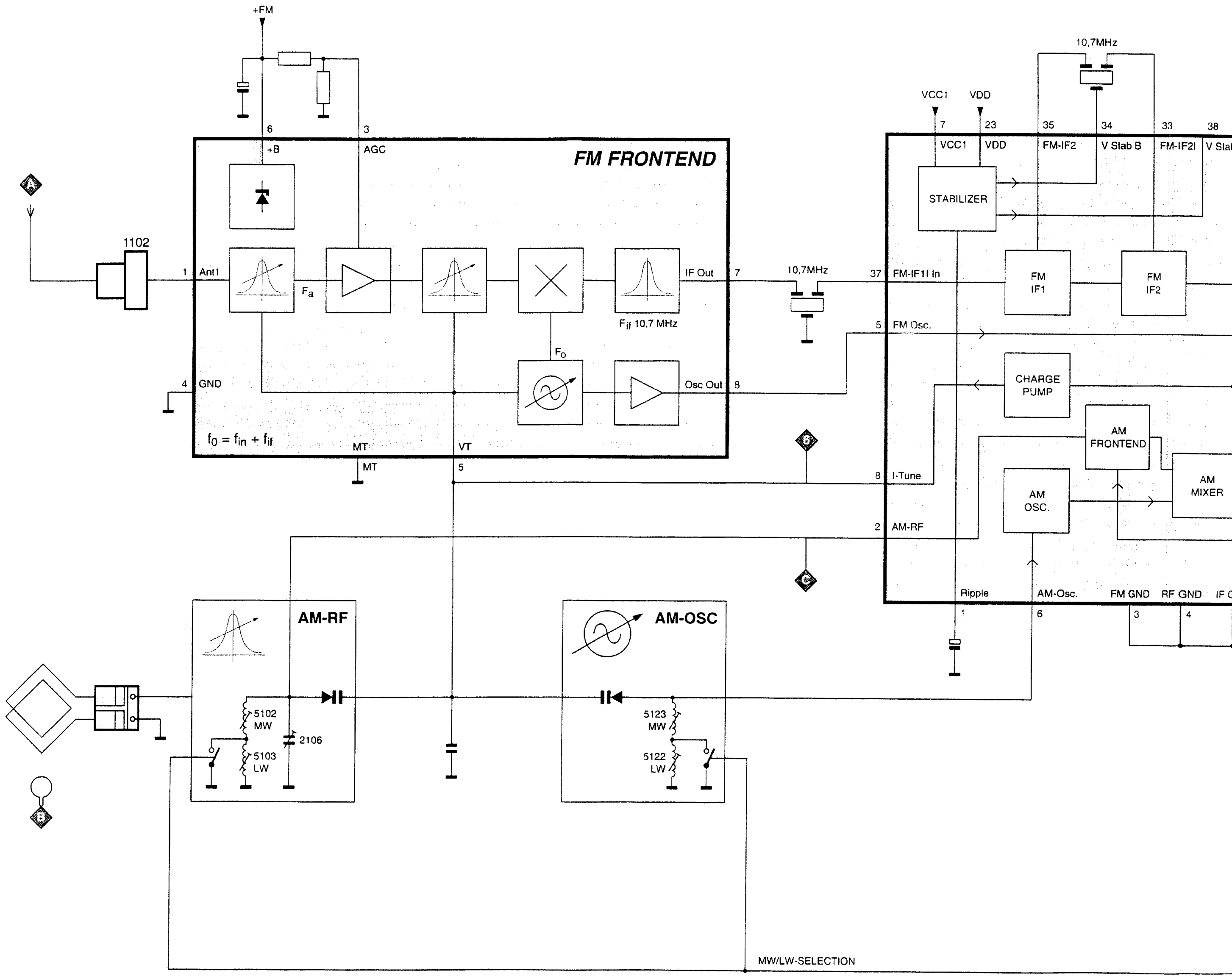
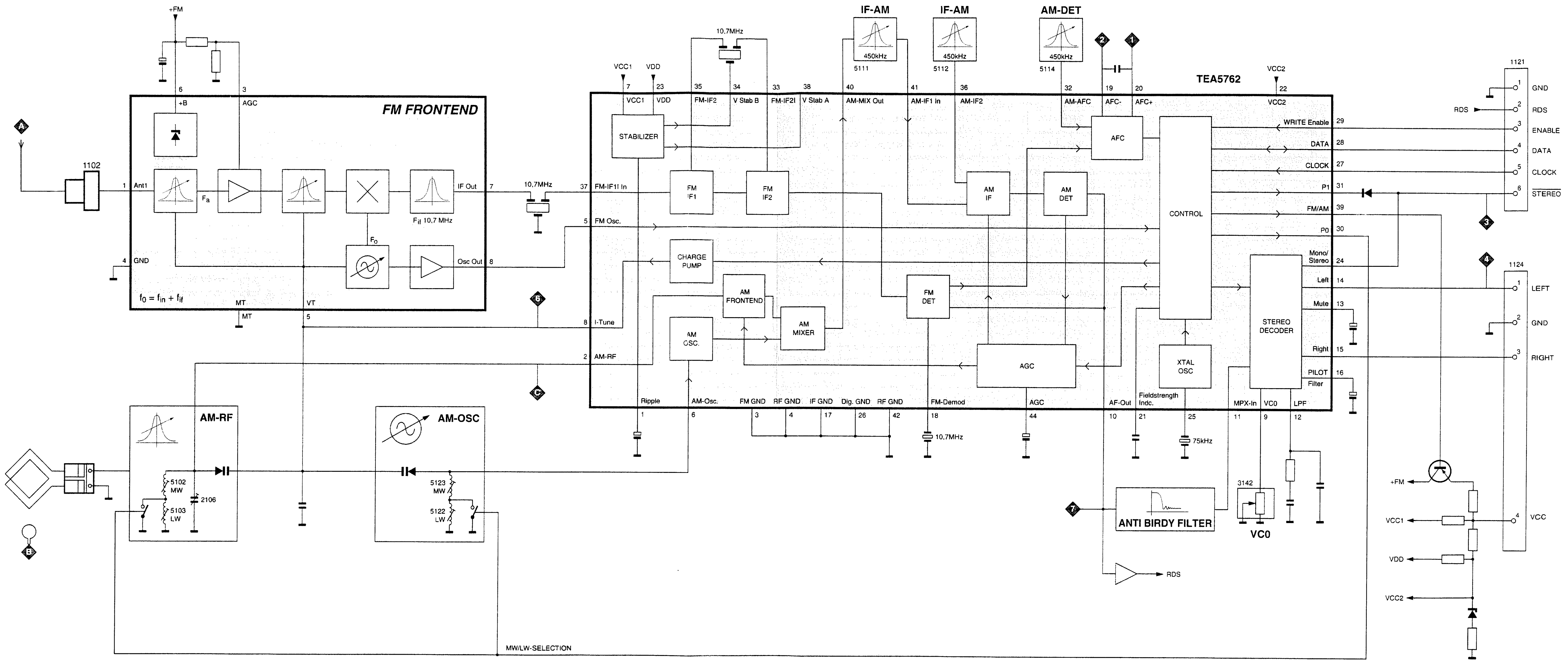
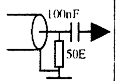
BLOCKDIAGRAM


+FM
6
3
+B
AGC
FM FRONTEND
A
1102
1
Ant1
Fa
Fif 10,7 MHz
IF Out
7
Fo
4
GND
Osc Out
8
f0 = fin + fif
MT
MT
VT
5
10,7MHz
VCC1
VDD
7
23
35
34
33
38
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
STABILIZER
37
FM-IF1I In
FM IF1
FM IF2
10,7MHz
5
FM Osc.
CHARGE PUMP
AM FRONTEND
8
I-Tune
AM OSC.
AM MIXER
2
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
1
6
3
4
AM-RF
5102 MW
5103 LW
2106
AM-OSC
5123 MW
5122 LW
B
MW/LW-SELECTION

BLOCKDIAGRAM


+FM
6
3
+B
AGC
FM FRONTEND
1102
1
Ant1
Fa
IF Out
7
Fif 10,7 MHz
Fo
4
GND
Osc Out
8
f0 = fin + fif
MT
VT
5
10,7MHz
A
B
C
6
AM-RF
5102
MW
5103
LW
2106
AM-OSC
5123
MW
5122
LW
MW/LW-SELECTION
10,7MHz
VCC1
VDD
7
23
35
34
33
38
40
41
36
32
19
20
22
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
IF-AM
450kHz
5111
IF-AM
450kHz
5112
AM-DET
450kHz
5114
2
1
TEA5762
VCC2
STABILIZER
37
FM-IF1I In
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
FM Osc.
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
I-Tune
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
1
6
3
4
17
26
42
18
44
10
21
25
11
9
12
10,7MHz
75kHz
WRITE Enable
29
DATA
28
CLOCK
27
P1
31
FM/AM
39
P0
30
Mono/ Stereo
24
Left
14
Mute
13
Right
15
PILOT Filter
16
3
4
1121
1
GND
RDS
2
RDS
3
ENABLE
4
DATA
5
CLOCK
6
STEREO
1124
1
LEFT
2
GND
3
RIGHT
7
ANTI BIRDY FILTER
3142
VC0
RDS
+FM
VCC1
4
VCC
VDD
VCC2

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	◇6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave *short pin 21 (IC7101) to ground*	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal		MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave	◇C		5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

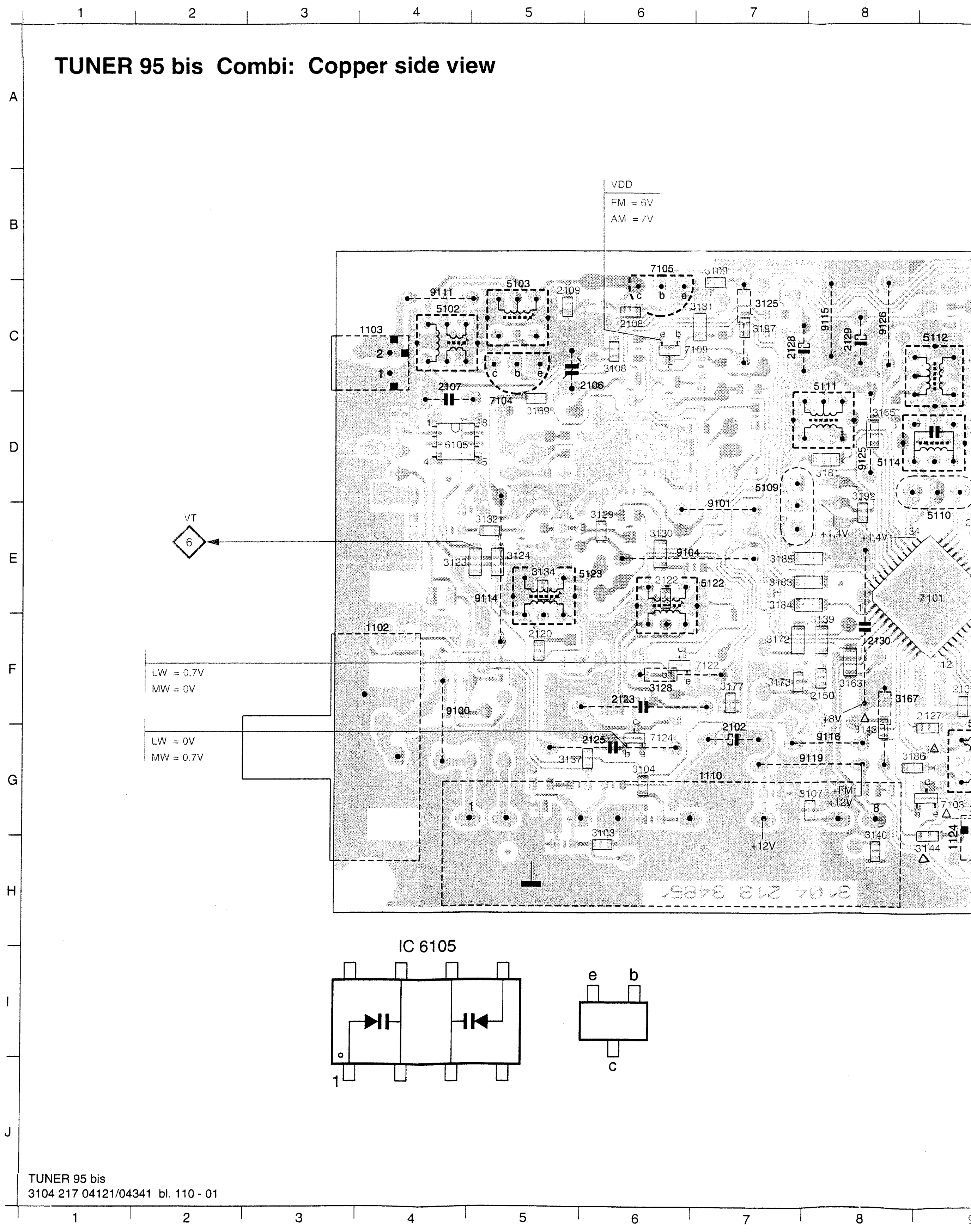
adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C6	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4

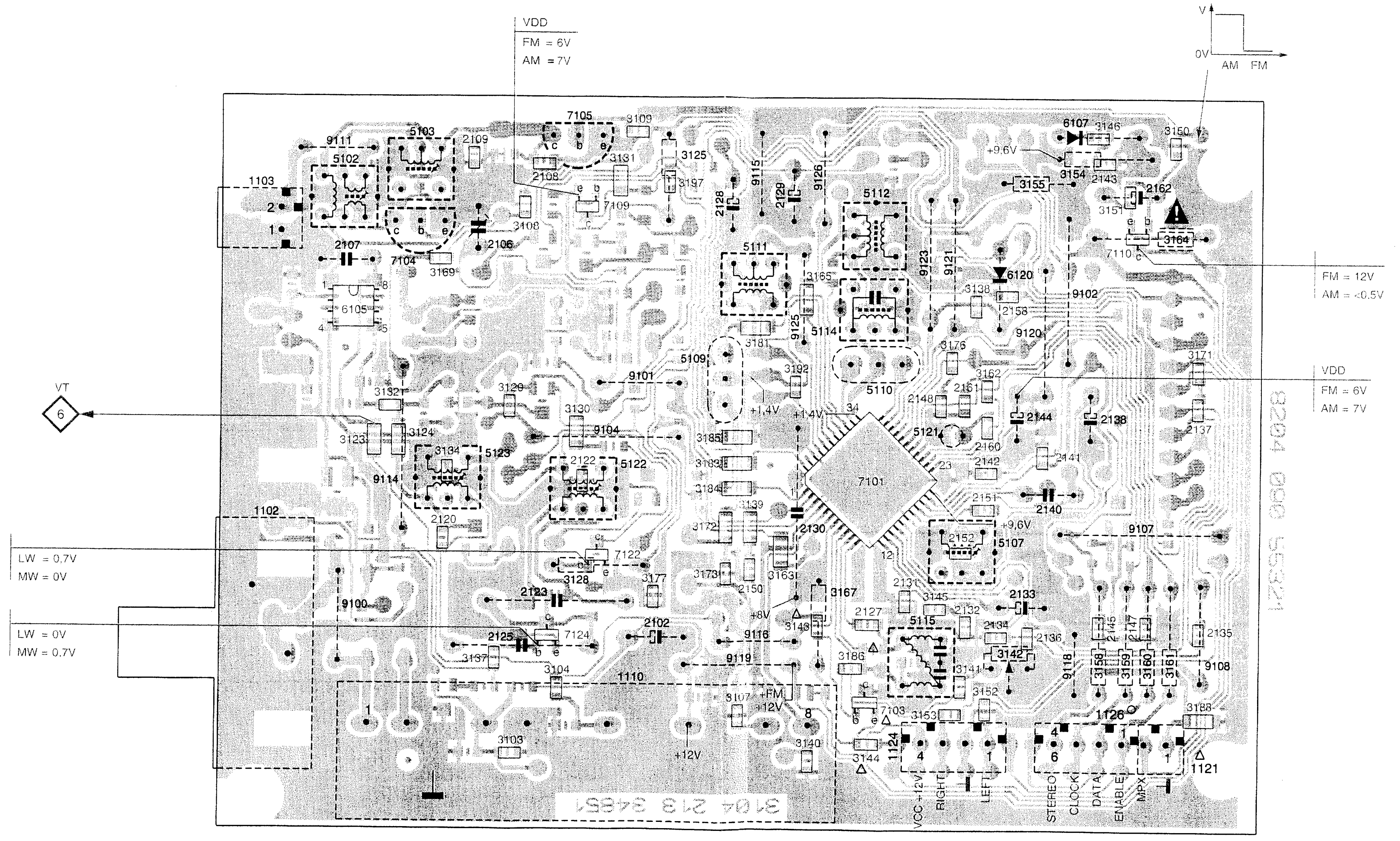
TUNER 95 bis Combi: Copper side view


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
VDD
FM = 6V
AM = 7V
VT
6
LW = 0.7V
MW = 0V
LW = 0V
MW = 0.7V
1102
1103
1110
5102
5103
5111
5112
5114
5109
5110
5122
5123
7101
7104
7105
7109
7122
7124
6105
2106
2107
2109
2120
2123
2125
2102
2127
2128
2129
2130
2150
3104
3103
3107
3123
3124
3125
3128
3129
3130
3131
3132
3134
3137
3140
3144
3167
3172
3173
3177
3185
3186
9100
9101
9104
9111
9114
9115
9116
9119
9126
+1,4V
+8V
+12V
+FM
3104 218 34851
IC 6105
1
e
b
c

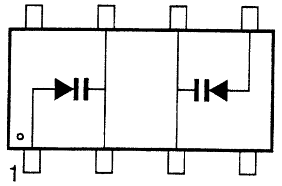
TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

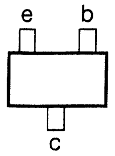
1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7	5103	C5	5121	E9	7104	D5	9102	D10	9118	G10
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7	5107	F10	5122	E7	7105	B6	9104	E6	9119	G7
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7	5109	D7	5123	E5	7109	C6	9107	F11	9120	D10
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E9	6105	D4	7110	D11	9108	G11	9121	D9
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C8	6107	B10	7122	F7	9111	C4	9123	D9
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C6	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8	5112	C9	6120	D10	7124	G6	9114	E5	9125	D8
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D8	7101	E9	9100	F4	9115	C8	9126	C8
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4	5115	G9	7103	G9	9101	E7	9116	G8		

TUNER 95 bis Combi: Copper side view


VDD
FM = 6V
AM = 7V
V
0V
AM
FM
FM = 12V
AM = <0.5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0.7V
MW = 0V
LW = 0V
MW = 0.7V
7105
3109
5103
2109
9111
5102
1103
3125
3197
3131
2108
7109
3108
2106
2107
7104
3169
6105
9115
2128
2129
9126
5112
5111
3165
6107
3146
3150
+9.6V
3155
3154
2143
2162
3151
3164
7110
6120
3138
2158
9102
9120
9123
9121
9125
5114
3181
5109
9101
3192
3176
3162
2161
3171
5110
2148
3132
3129
3130
9104
3185
+1.4V
+1.4V
34
5121
2144
2138
2137
3123
3124
3134
5123
2122
5122
3183
3184
7101
2160
2142
3141
9114
1102
2120
3172
2130
2151
2140
9107
+9.6V
2152
5107
7122
3128
3177
3173
2150
3163
3167
2131
3145
2133
2123
9100
2102
7124
2125
3137
3104
1110
9116
9119
+8V
3148
2127
2132
2134
5115
2136
3142
9118
2145
2147
3159
3160
3161
2135
9108
3186
3141
3152
3107
+FM
+12V
8
7103
3153
1126
3188
3103
+12V
3140
1124
3144
1121
4
6
1
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
3104 213 34851
8204 000 55321

IC 6105



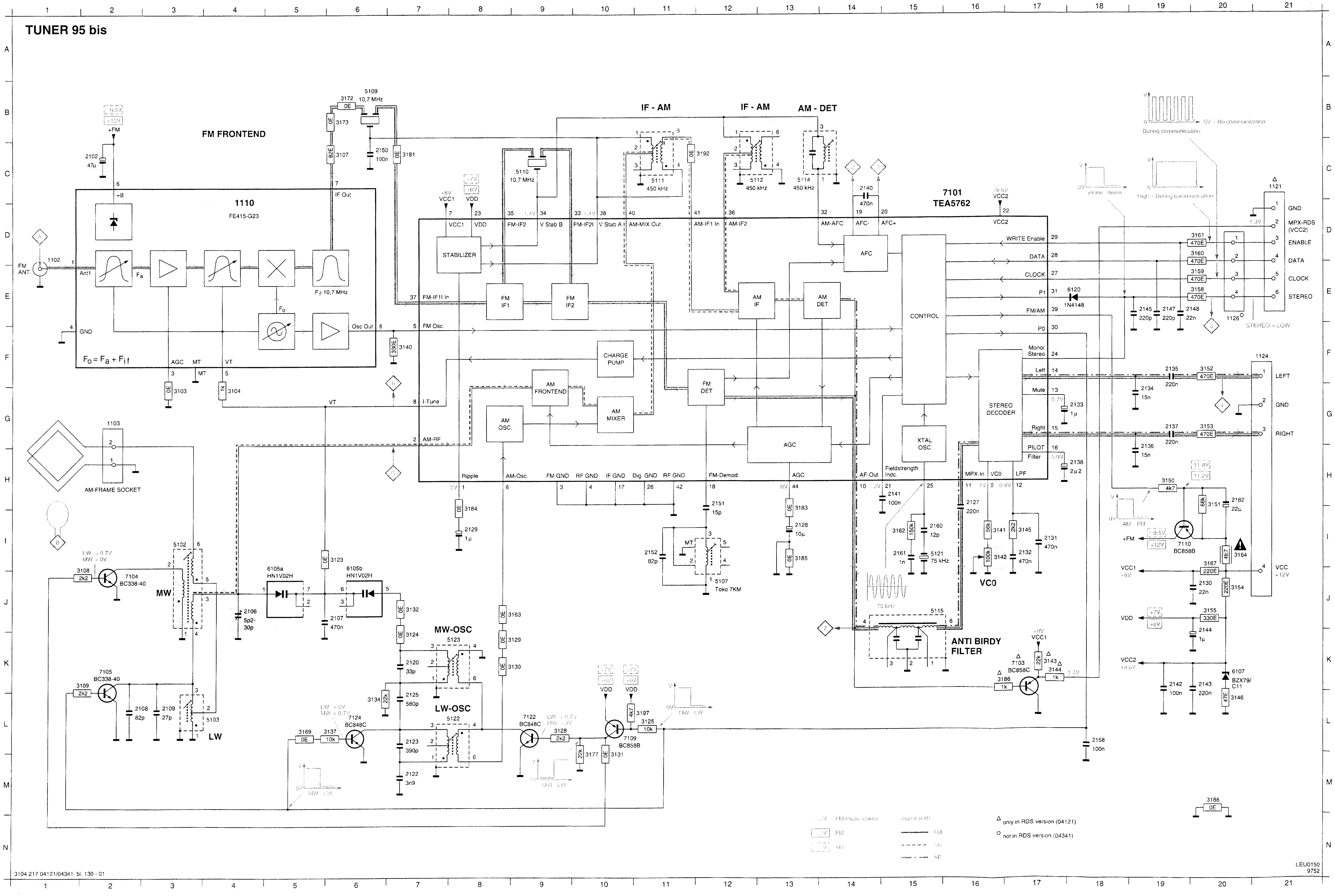


△ only in RDS version (04121)

○ not in RDS version (04341)

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis


FM FRONTEND
1110
FE415-G23
+B
Ant1
F_a
F_{if} 10,7 MHz
IF Out
Osc Out
F_o
GND
$F_o = F_a + F_{if}$
AGC
MT
VT
FM ANT
1102
+FM
2102 47µ
5109 10,7 MHz
3172 0E
3173 0E
3107 82E
2150 100n
3181 0E
3140 330E
3103 0E
3104 1k
IF - AM
IF - AM
AM - DET
5110 10,7 MHz
5111 450 kHz
5112 450 kHz
5114 450 kHz
3192 0E
2140 470n
7101
TEA5762
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
FM-IF1 In
FM Osc.
I-Tune
AM-RF
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
6120 1N4148
3161 470E
3160 470E
3159 470E
3158 470E
2145 220p
2147 220p
2148 22n
1126
STEREO = LOW
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
During communication
0V = No communication
mono stereo
High = During communication
1124
LEFT
GND
RIGHT
VCC +12V
2135 220n
3152 470E
2134 15n
2133 1µ
2137 220n
3153 470E
2136 15n
2138 2µ2
3150 4k7
3151 68k
2162 22µ
7110 BC858B
AM FM
3164 4E7
3167 220E
2130 22n
3154 220E
VCC1 +8V
VDD
3155 330E
2144 1µ
VCC2 +9.6V
2142 100n
2143 220n
6107 BZX79/ C11
3146 47E
3184 0E
2129 1µ
2151 15p
2152 82p
5107 Toko 7KM
3183 0E
2128 10µ
3185 0E
2141 100n
3162 150k
2160 12p
2161 1n
5121 75 kHz
3141 56k
3142 100k
3145 2k2
2132 470n
2131 470n
2127 220n
VCO
75 kHz
5115
ANTI BIRDY FILTER
7103 BC858C
3186 1k
3143 22k
3144 1k
2158 100n
1103
AM-FRAME SOCKET
5102
MW
7104 BC338-40
3108 2k2
LW = 0.7V MW = 0V
7105 BC338-40
3109 2k2
2108 82p
2109 27p
5103
LW
2106 5p2- 30p
6105a HN1V02H
6105b HN1V02H
3123 0E
2107 470n
3132 0E
3124 0E
MW-OSC
5123
2120 33p
3134 22k
2125 560p
LW-OSC
5122
2123 390p
2122 3n9
3163 0E
3129 0E
3130 0E
7124 BC848C
3169 0E
3137 10k
7122 BC848C
3128 2k2
3177 22k
3131 0E
7109 BC858B
3197 4k7
3125 10k
MW LW
3188 0E
...V FM mode stereo
...V FM
...V AM
Signal path
FM
AM
AF
Δ only in RDS version (04121)
○ not in RDS version (04341)
3104 217 04121/04341 bl. 130 - 01
LEU0150 9752

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47μF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 63V
2125	4822 121 10578	560P 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10μF 20% 50V
2129	4822 124 40242	1μF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1μF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2μF 20% 50V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1μF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	50V 15pF 5%
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22μF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3123	4822 051 10008	0R 5% 0,25W
3124	4822 051 10008	0R 5% 0,25W
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R 5% 0,25W
3131	4822 051 10008	0R 5% 0,25W
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R 5% 0,25W
3140	4822 051 20331	330R 5% 0,1W
3141	4822 051 20563	56k 5% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 051 20224	220k 5% 0,1W
3163	4822 051 10008	0R 5% 0,25W
3164	4822 052 10478 ⚠	4R7 5% 0,33W
3165	4822 051 10008	0R 5% 0,25W
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R 5% 0,25W
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3181	4822 051 10008	0R 5% 0,25W
3183	4822 051 10008	0R 5% 0,25W
3184	4822 051 10008	0R 5% 0,25W
3185	4822 051 10008	0R 5% 0,25W
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R 5% 0,25W
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW AERIAL
5103	4822 157 71635	LW AERIAL
5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz

5114	4822 157 70302	AM-IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHz
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6107	4822 130 34488	BZX79-B11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note: Only the parts mentioned in this list are normal service spare parts.

KARAOKE BOARD

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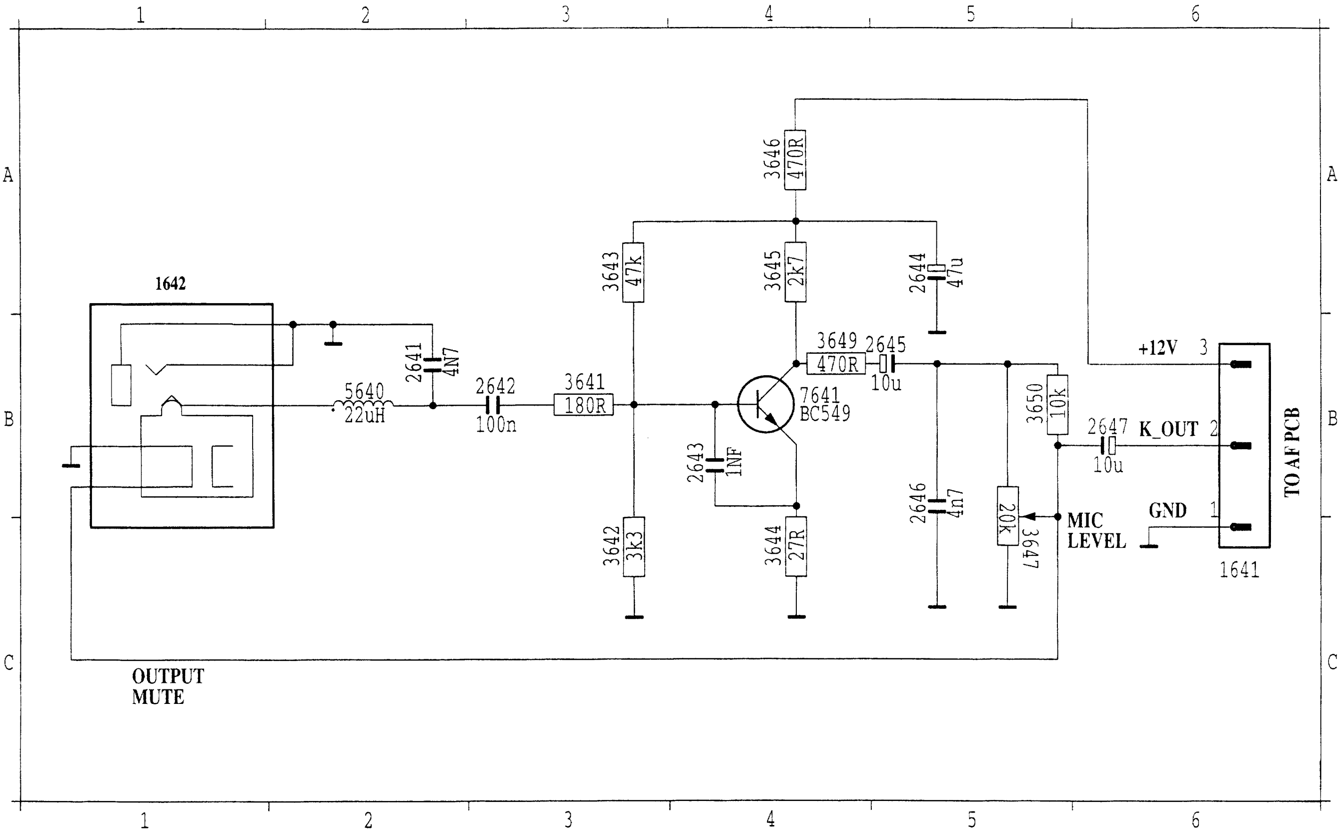
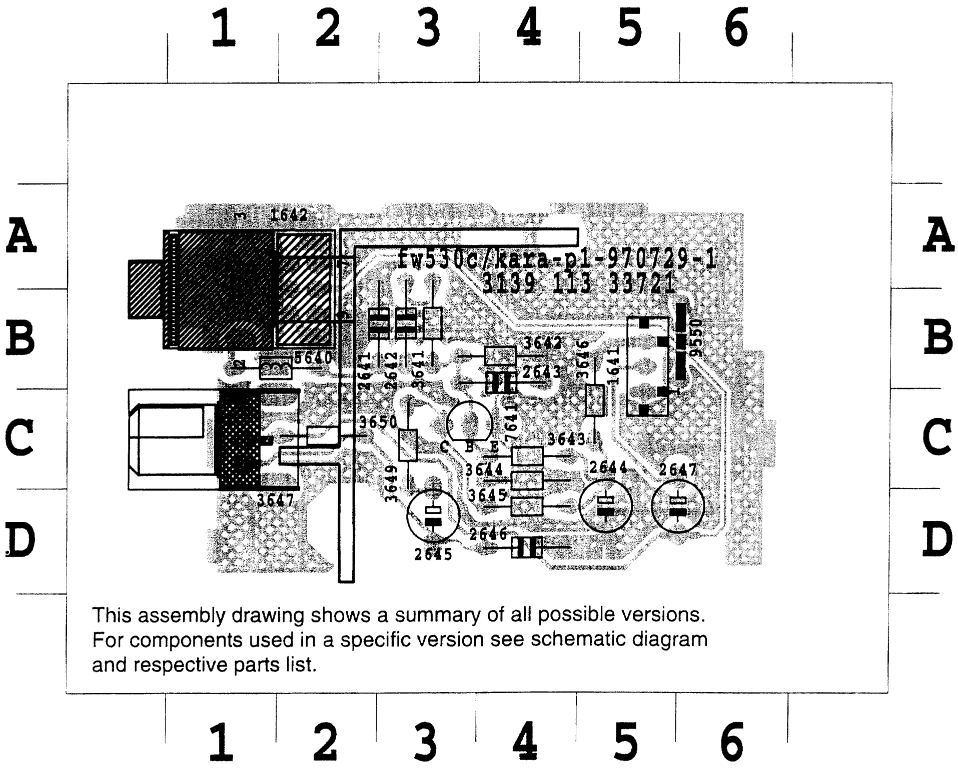
Circuit Diagram .... 8 - 2
Partlist .... 8 - 3

KARAOKE CIRCUIT & LAYOUT

1641 B 6	2642 B 3	2645 B 5	3641 B 3	3644 C 4	3647 C 5	5640 B 2
1642 A 1	2643 B 4	2646 B 5	3642 C 3	3645 A 4	3649 B 4	7641 B 4
2641 B 2	2644 A 5	2647 B 6	3643 A 3	3646 A 4	3650 B 5	


1
2
3
4
5
6
A
B
C
1642
3646
470R
3643
47k
3645
2k7
2644
47u
2641
4N7
5640
22uH
2642
100n
3641
180R
3649
470R
2645
10u
7641
BC549
2643
1NF
3650
10k
2647
10u
K_OUT
+12V
GND
TO AF PCB
2646
4n7
20k
3647
MIC LEVEL
3642
3k3
3644
27R
1641
OUTPUT MUTE

1641 B 5	2643 B 4	2647 D 6	3644 D 4	3649 C 2
1642 B 1	2644 D 5	3641 B 3	3645 D 4	5640 B 1
2641 B 2	2645 D 3	3642 B 3	3646 C 4	7641 C 3
2642 B 3	2646 D 4	3643 C 4	3647 C 1	9550 B 6


1
2
3
4
5
6
A
B
C
D
1642
fw530c/kara-p1-970729-1
3139 113 33721
5640
2641
2642
3641
3642
2643
3646
1641
9550
3650
7641
C
B
E
3643
3644
3645
2644
2647
3649
3647
2645
2646

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

ELECTRICAL PARTS LIST - KARAOKE BOARD

MISCELLANEOUS

1642	4822 267 40898	Mic. Socket

CAPACITORS

2641	4822 126 11714	4,7nF 20%
2642	4822 126 12882	100nF +80/-20% 50V
2643	4822 122 33197	1nF 10% 50V
2644	4822 124 41751	47µF 20% 50V
2645	4822 124 41579	10µF 20% 50V
2646	4822 126 11714	4,7nF 20%
2647	4822 124 41579	10µF 20% 50V

RESISTORS

3641	4822 116 52213	180R 5% 0,5W
3642	4822 116 52269	3k3 5% 0,5W
3643	4822 116 83884	47k 5% 0,5W
3644	4822 116 52188	27R 5% 0,5W
3645	4822 116 52263	2k7 5% 0,5W
3646	4822 116 83883	470R 5% 0,5W
3647	4822 101 21204	20KA
3649	4822 116 83883	470R 5% 0,5W

COIL

5640	4822 157 52983	22µH 10%

TRANSISTOR

7641	4822 130 41096	BC550C

Note: Only the parts mentioned in this list are normal service parts.

ETF6 TAPE MODULE

(Non-dolby Version)

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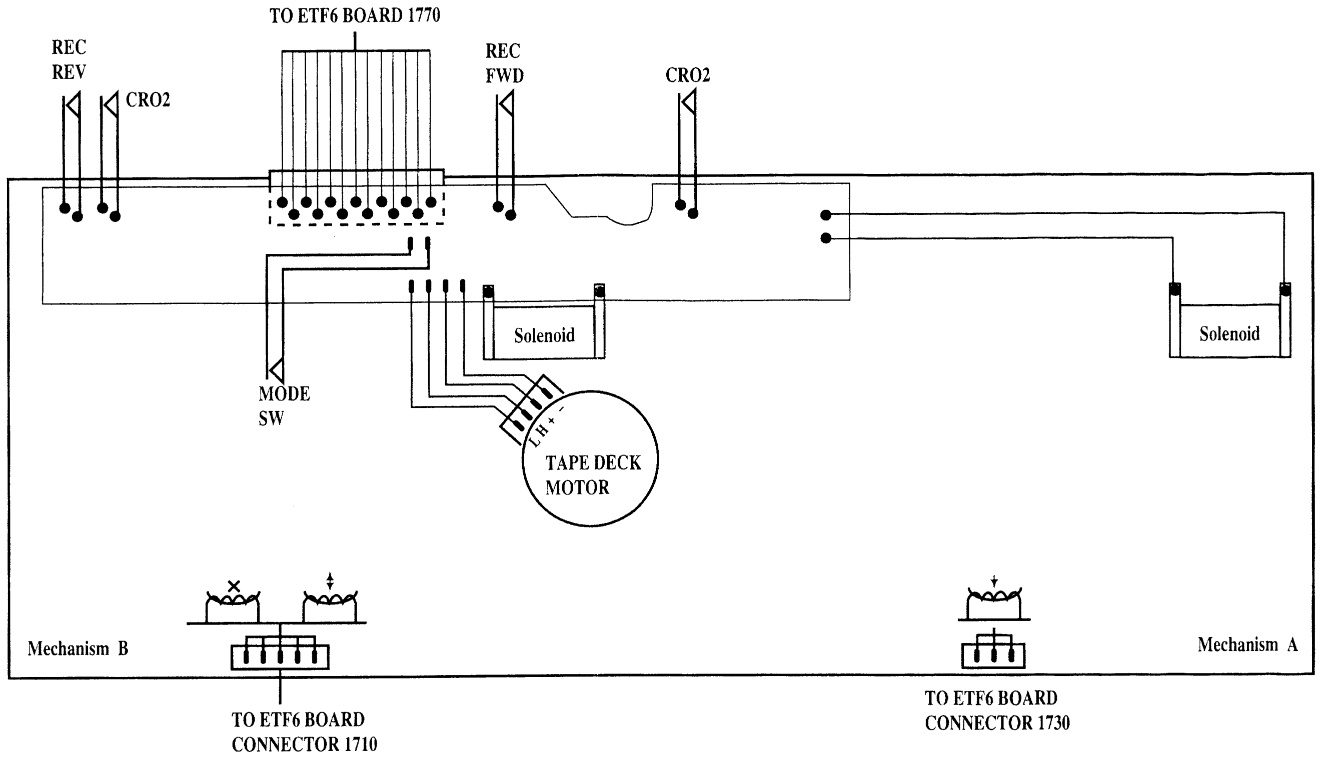
ETF6 Non-dolby board layouts................................. 9-6
Analog Circuit diagram 9-7
Servo Circuit diagram 9-8
Exploded views & parts list....................................... 9-9
Electrical parts list.. 9-12

Tapedeck wiring (Double deck)


TO ETF6 BOARD 1770
REC REV
CRO2
REC FWD
CRO2
Solenoid
Solenoid
MODE SW
L H + -
TAPE DECK MOTOR
Mechanism B
Mechanism A
TO ETF6 BOARD CONNECTOR 1710
TO ETF6 BOARD CONNECTOR 1730

OPTIONS / VARIANTS TABLE

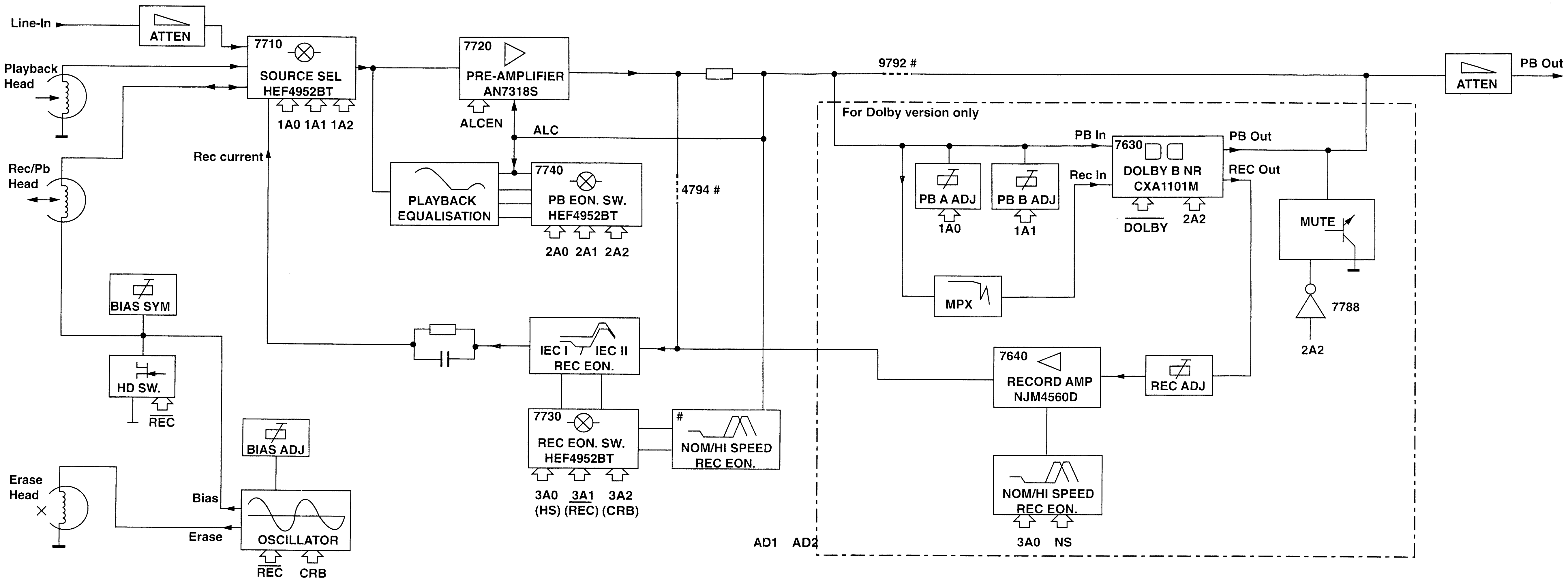
MODULE	**ETF6**	
VARIANT	**1**	**2**
NAME	**ND/DD/FR**	**ND/DD/FF**
Deck configuration	double	double
Autoreverse	yes (B)	no
Auto-replay	no	yes (B)
Motor configuration	single	single
Auto tape type selection	yes	yes
Dolby B type Noise Reduction	no	no
19 kHz pilot suppression	no	no
High speed dubbing	yes	yes

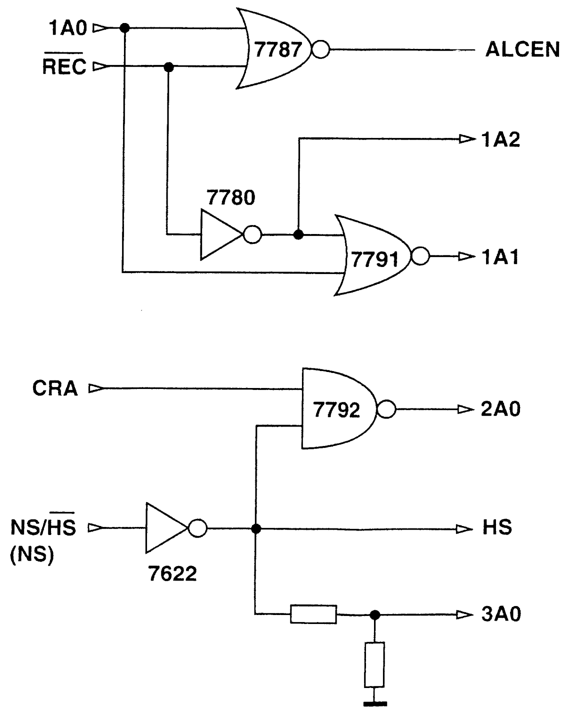
DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

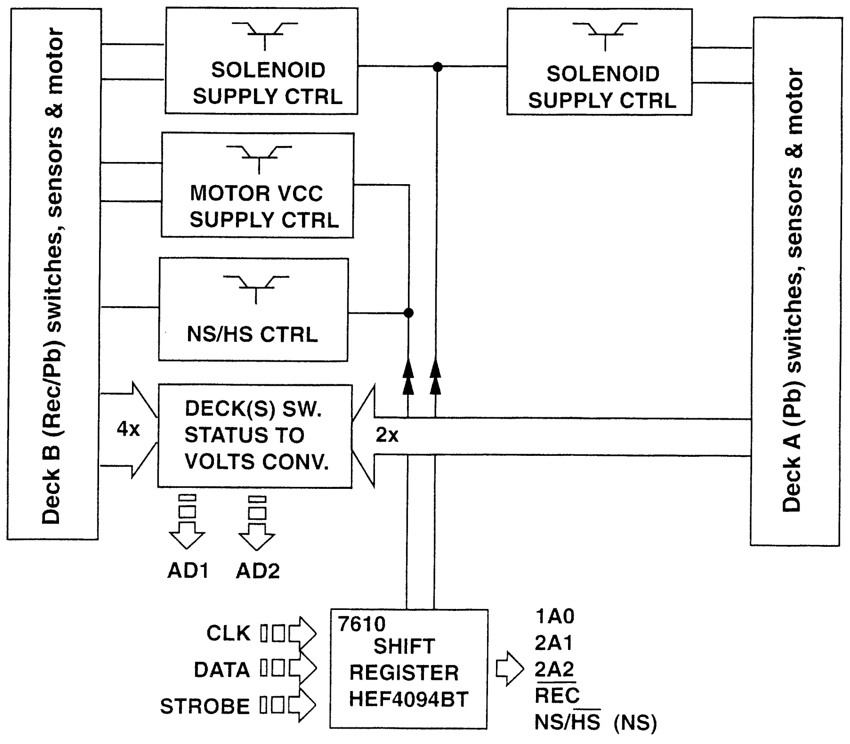
Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
3723	12k	15k
3724	12k	15k
3743	1k2	1k
3744	1k2	1k
3769	12k	8k2
3772	4k7	5k6
3774	10k	8k2

BLOCK DIAGRAM


Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
Rec current
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
9792 #
4794 #
ATTEN
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
PB B ADJ
1A0
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
PLAYBACK EQUALISATION
7740
PB EON. SW.
HEF4952BT
2A0 2A1 2A2
BIAS SYM
HD SW.
REC
IEC I
IEC II
REC EON.
7640
RECORD AMP
NJM4560D
REC ADJ
7730
REC EON. SW.
HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED REC EON.
NOM/HI SPEED REC EON.
3A0 NS
AD1 AD2
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors & motor
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
AD1 AD2
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and then output to the AF Board through pins 5 and 6 of the connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) and then back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)
   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. IC7610(HEF4094BT) also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is also controlled by IC7610(HEF4094BT) via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

15. IC7630 (CXA1101M)
    IC7630 (CXA1101M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF5 BOARD

○	1	REC-R	Record input right
○	2	REC-L	Record input left
○	3	GND A	AF Ground
○	4	+12V	D.C. supply (+12V) in
○	5	TAPE-R	Playback output right
○	6	TAPE-L	Playback output left
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF5 BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON *(For ETF6 only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD R-	R/P Head right channel positive
○	3	CMN	R/P Head return ground
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON *(For ETF5 only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

○	1	A PB HD R+	Pb Head right channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD L+	Pb Head left channel positive

CONNECTOR 1740 — DECK B CONTROL INTERFACE *(For ETF5 Double Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	H	H pin for motor	
○	10	L	L pin for motor	

CONNECTOR 1750 — DECK A CONTROL INTERFAC *(For ETF5 Double Deck only)*

○	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	2	PHOTO A	Photo sensor output (tape movement indication)	
○	3	SOL A	Solenoid supply	
○	4	Vcc	Deck/Motor supply	
○	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	6	GND M	Deck/Motor ground	

CONNECTOR 1760 — DECK B CONTROL INTERFACE *(For ETF5 Single Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	

CONNECTOR 1770 — DECK B CONTROL INTERFACE *(For ETF6 only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	L	L pin for motor	
○	10	H	H pin for motor	
○	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	12	SOL A	Solenoid supply for deck A	
○	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM ELECTRONICS

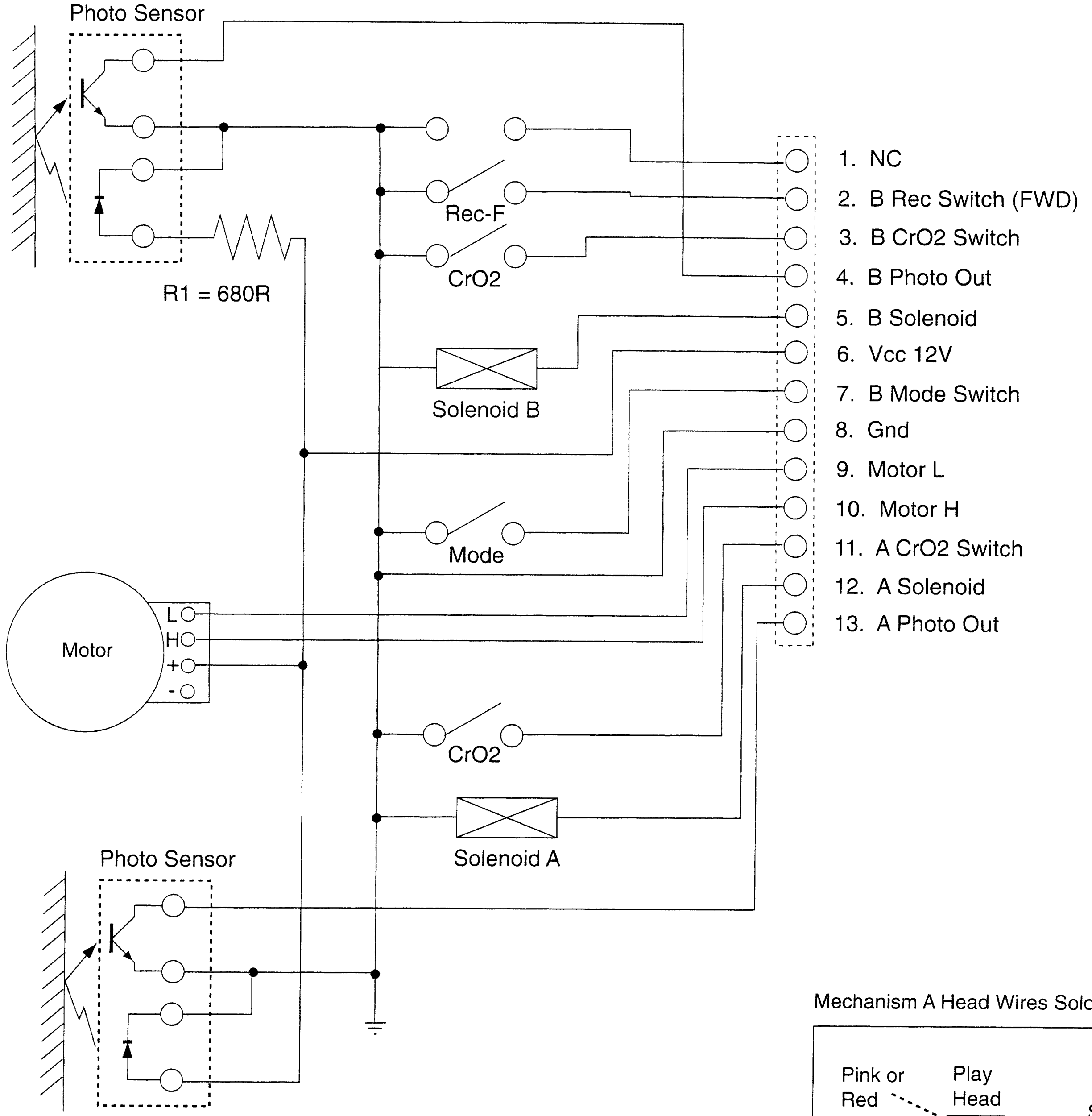
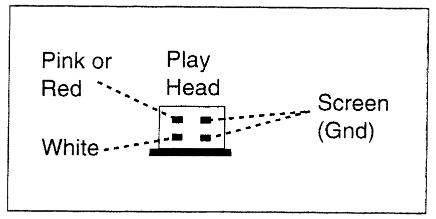
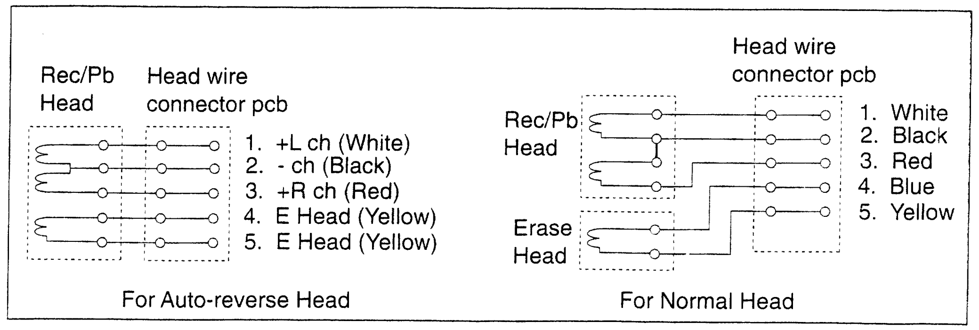


Photo Sensor
R1 = 680R
Rec-F
CrO2
Solenoid B
Mode
Motor
L
H
+
-
CrO2
Solenoid A
Photo Sensor
1. NC
2. B Rec Switch (FWD)
3. B CrO2 Switch
4. B Photo Out
5. B Solenoid
6. Vcc 12V
7. B Mode Switch
8. Gnd
9. Motor L
10. Motor H
11. A CrO2 Switch
12. A Solenoid
13. A Photo Out

Mechanism A Head Wires Soldering


Pink or
Red
White
Play
Head
Screen
(Gnd)

Mechanism B Head Wires Soldering


Rec/Pb
Head
Head wire
connector pcb
1. +L ch (White)
2. - ch (Black)
3. +R ch (Red)
4. E Head (Yellow)
5. E Head (Yellow)
For Auto-reverse Head
Rec/Pb
Head
Erase
Head
Head wire
connector pcb
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	◇1 or ◇2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only
# For Auto-reverse version only

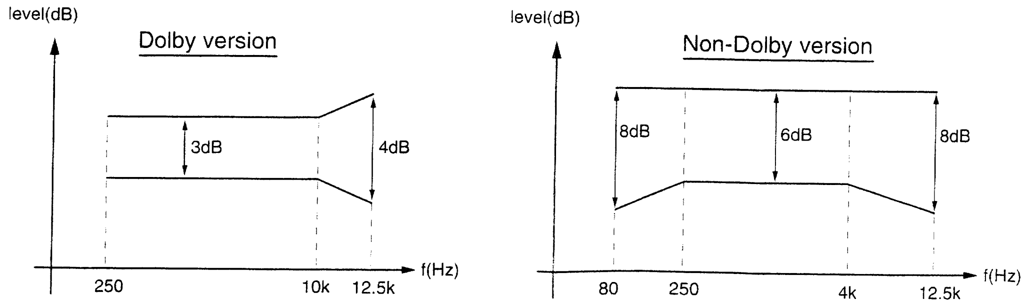


figure. 1

Re

PF

DE

Ch

Inje
100
10k
via

Inje
via

Re

AD

Inje
via

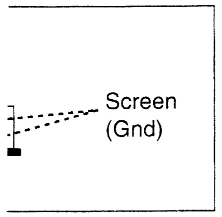
Rem

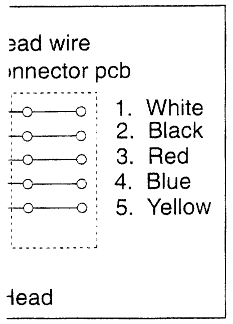
* Fo

FWD)

h

Vires Soldering





General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	◇1 or ◇2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only

# For Auto-reverse version only

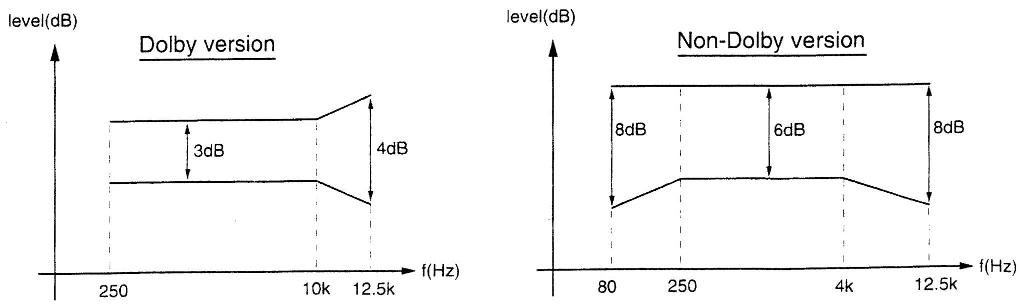


figure. 1

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
DECK B	CrO 2	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
					3785 *	left = right
	FERRO				check only	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	CrO 2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check only	limits see fig.2
Inject 1kHz 8.85mV via ◇3 or ◇4	CrO 2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						
ADJUST DOLBY RECORD LEVEL *						
Inject 400Hz 8.85mV via ◇3 or ◇4	CrO 2	RECORD	◇9 or ◇10 LEFT RIGHT	mV-meter	3655 & 3556	420mV
	RECORDED CASSETTE	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	check	170mV ± 1dB
Remark: If measured value is out, re-adjust record level up or down slightly to attain play level.						

* For Dolby version only

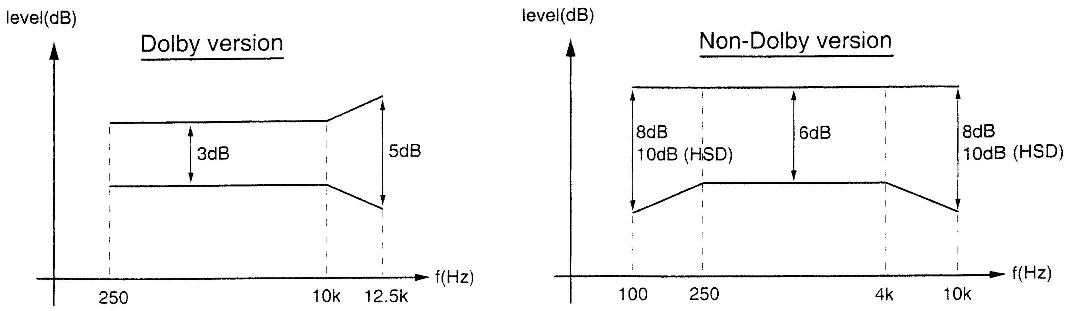
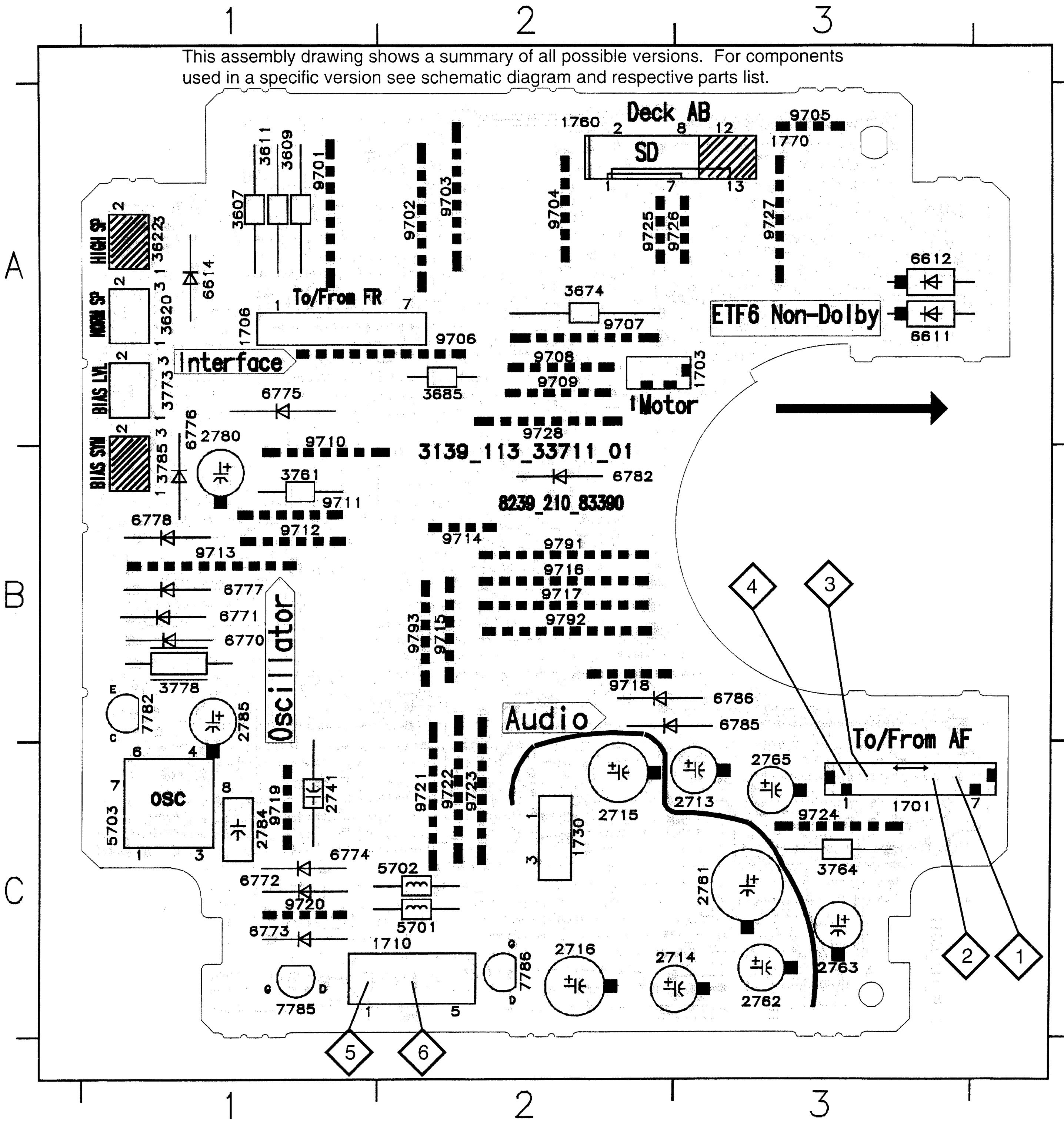


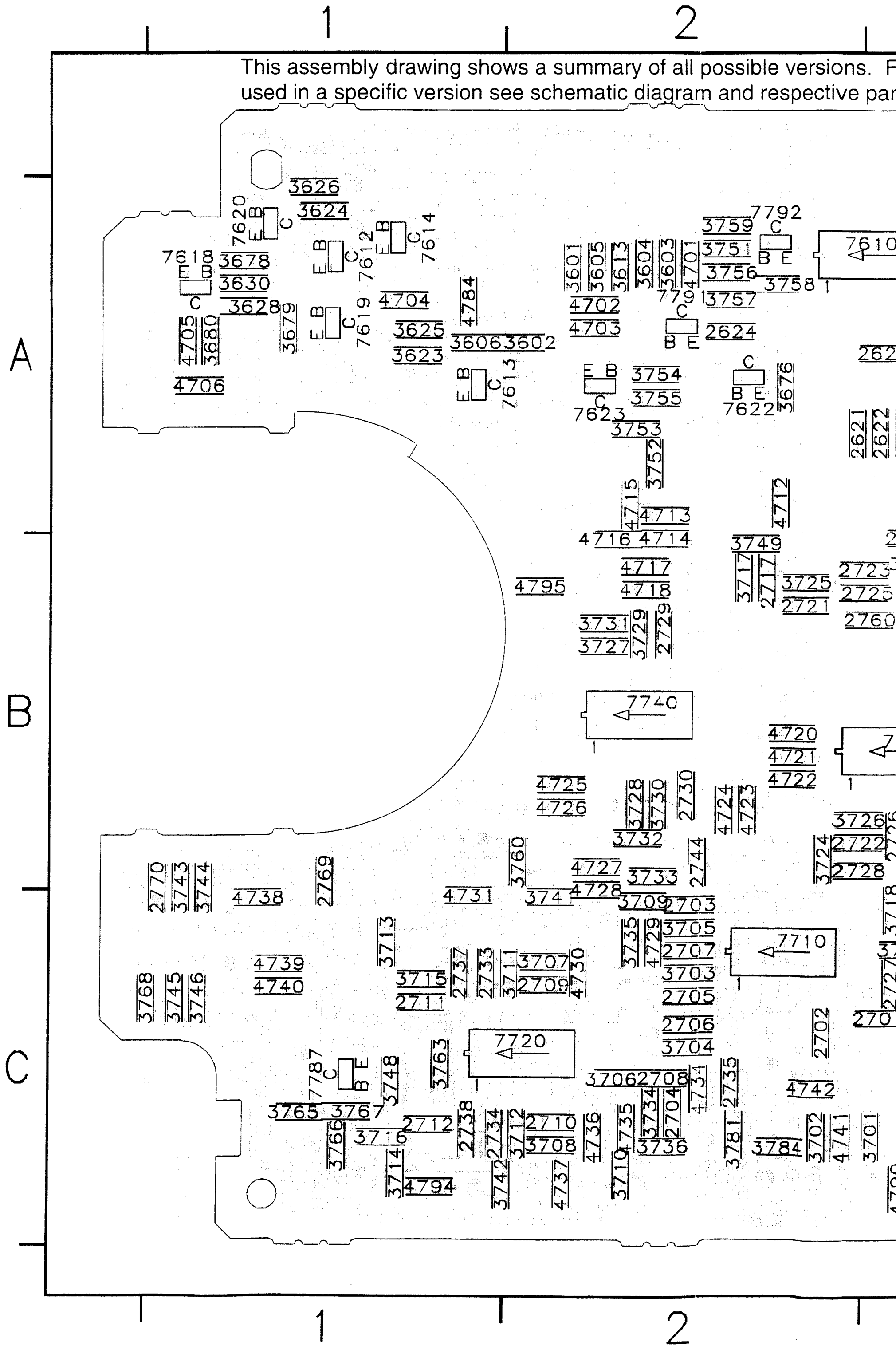
figure. 2

COMPONENT LAYOUT


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
1
2
3
A
B
C
Deck AB
SD
1760
1770
9705
To/From FR
1706
Interface
ETF6 Non-Dolby
6612
6611
Motor
1703
3674
9707
9706
9708
9709
3685
9728
3139_113_33711_01
8239_210_83390
HIGH SP
NORM SP
BIAS LVL
BIAS SW
3607
3611
3609
9701
9702
9703
9704
9725
9726
9727
3622
3620
3773
6614
6775
6776
3785
2780
9710
3761
9711
6782
6778
9712
9713
9714
9791
9716
9717
9792
9793
9715
6777
6771
6770
Oscillator
3778
7782
2785
OSC
5703
2784
9719
2741
9718
6786
6785
Audio
To/From AF
1701
2715
2713
2765
9724
3764
1730
9721
9722
9723
6774
6772
9720
6773
5702
5701
1710
2761
2763
2716
2714
2762
7785
7786
1
2
3
4
5
6

1701	C3	9720	C1
1703	A2	9721	C2
1706	A1	9722	C2
1710	C2	9723	C2
1730	C2	9724	C3
1770	A2	9725	A2
2713	B3	9726	A3
2714	C3	9727	A3
2715	B2	9728	A2
2716	C2	9791	B2
2741	C1	9792	B2
2761	C3	9793	B2
2762	C3		
2763	C3		
2765	C3		
2780	B1		
2784	C1		
2785	B1		
3607	A1		
3609	A1		
3611	A1		
3620	A1		
3622	A1		
3674	A2		
3685	A2		
3761	B1		
3764	C3		
3773	A1		
3778	B1		
3785	B1		
5701	C2		
5702	C2		
5703	C1		
6611	A3		
6612	A3		
6614	A1		
6770	B1		
6771	B1		
6772	C1		
6773	C1		
6774	C1		
6775	A1		
6776	B1		
6777	B1		
6778	B1		
6782	B2		
6785	B2		
6786	B2		
7782	B1		
7785	C1		
7786	C2		
9701	A1		
9702	A2		
9703	A2		
9704	A2		
9705	A3		
9706	A2		
9707	A2		
9708	A2		
9709	A2		
9710	B1		
9711	B1		
9712	B1		
9713	B1		
9714	B2		
9715	B2		
9716	B2		
9717	B2		
9718	B2		
9719	C1		

CHIP LAYOUT


This assembly drawing shows a summary of all possible versions. F
used in a specific version see schematic diagram and respective par
1
2
A
B
C
3626
3624
7620
7618
3678
3630
3628
3679
7612
7614
7619
4704
3625
3623
4784
3606
3602
7613
4705
3680
4706
3601
3605
3613
3604
3603
4701
4702
4703
7792
3759
3751
3756
3758
3757
2624
7610
3754
3755
7623
7622
3676
3753
3752
2621
2622
4715
4713
4716
4714
4717
4718
4712
3749
3717
2717
3725
2721
4795
3731
3729
3727
2729
7740
4720
4721
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2770
3743
3744
4738
2769
3760
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2703
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3705
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3703
2705
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7710
3768
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3707
2709
4730
2702
7787
3748
3763
7720
3706
2708
4734
2735
4742
3765
3767
3766
3716
2712
3714
4794
2738
3742
2734
3712
2710
3708
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4735
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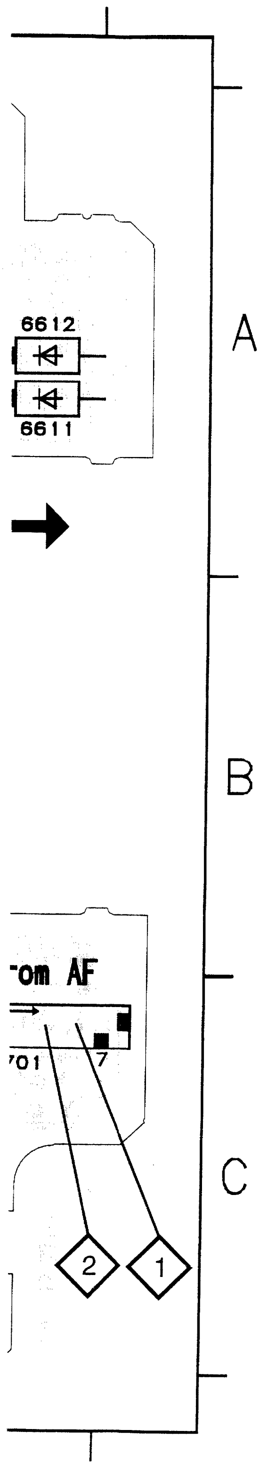
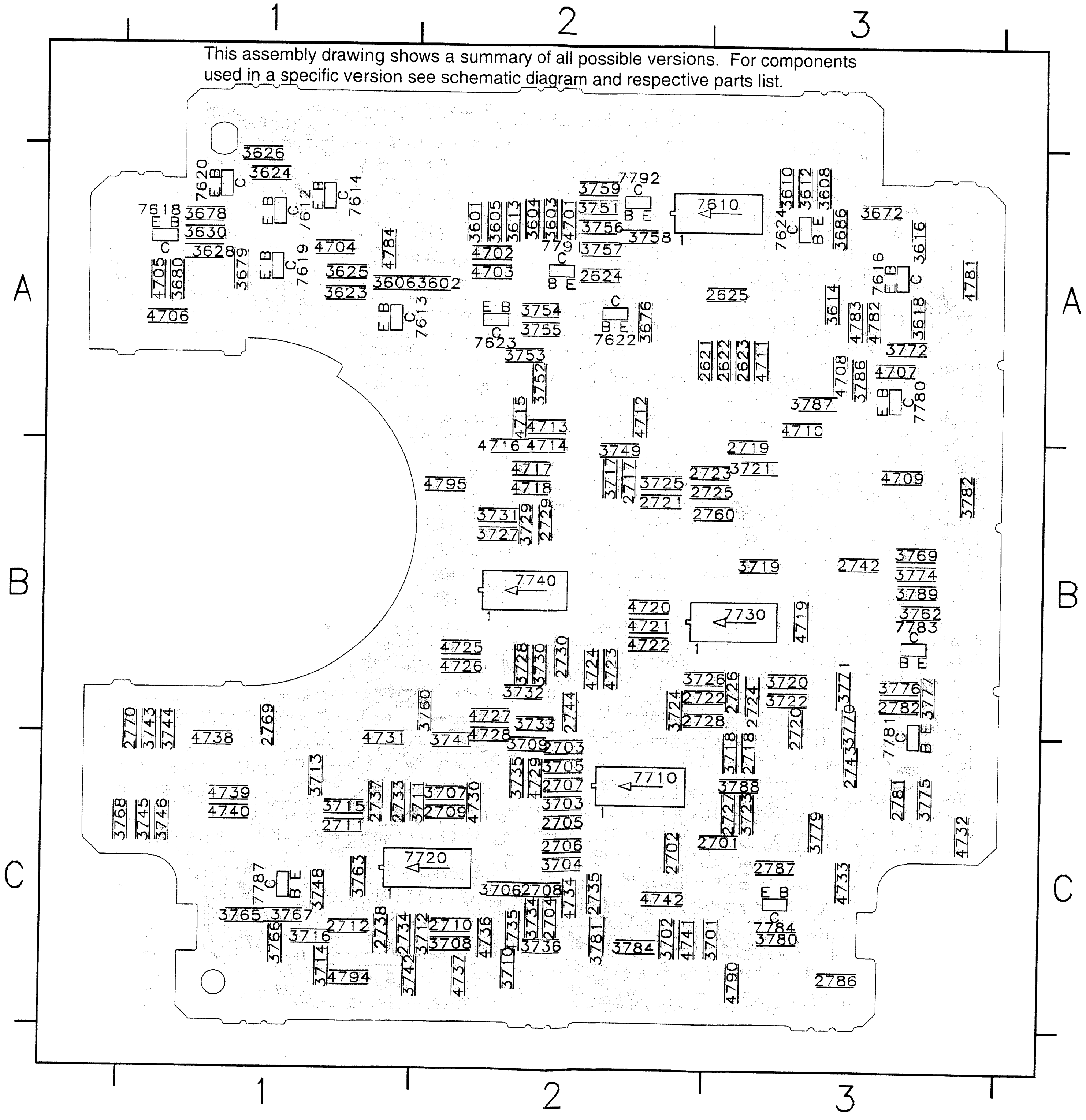
2704
3736
3781
3784
3702
4741
3701

CHIP LAYOUT


6612
6611
A
B
C
rom AF
701
7
2
1

1701	C3	9720	C1
1703	A2	9721	C2
1706	A1	9722	C2
1710	C2	9723	C2
1730	C2	9724	C3
1770	A2	9725	A2
2713	B3	9726	A3
2714	C3	9727	A3
2715	B2	9728	A2
2716	C2	9791	B2
2741	C1	9792	B2
2761	C3	9793	B2
2762	C3		
2763	C3		
2765	C3		
2780	B1		
2784	C1		
2785	B1		
3607	A1		
3609	A1		
3611	A1		
3620	A1		
3622	A1		
3674	A2		
3685	A2		
3761	B1		
3764	C3		
3773	A1		
3778	B1		
3785	B1		
5701	C2		
5702	C2		
5703	C1		
6611	A3		
6612	A3		
6614	A1		
6770	B1		
6771	B1		
6772	C1		
6773	C1		
6774	C1		
6775	A1		
6776	B1		
6777	B1		
6778	B1		
6782	B2		
6785	B2		
6786	B2		
7782	B1		
7785	C1		
7786	C2		
9701	A1		
9702	A2		
9703	A2		
9704	A2		
9705	A3		
9706	A2		
9707	A2		
9708	A2		
9709	A2		
9710	B1		
9711	B1		
9712	B1		
9713	B1		
9714	B2		
9715	B2		
9716	B2		
9717	B2		
9718	B2		
9719	C1		


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
1
2
3
A
B
C
7610
7710
7720
7730
7740
7792
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3623
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4704
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4706
3601
3605
3613
3604
3603
4701
4702
4703
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3755
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3752
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3608
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2623
4711
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4708
3786
4707
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2760
4709
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3789
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3708
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3706
2708
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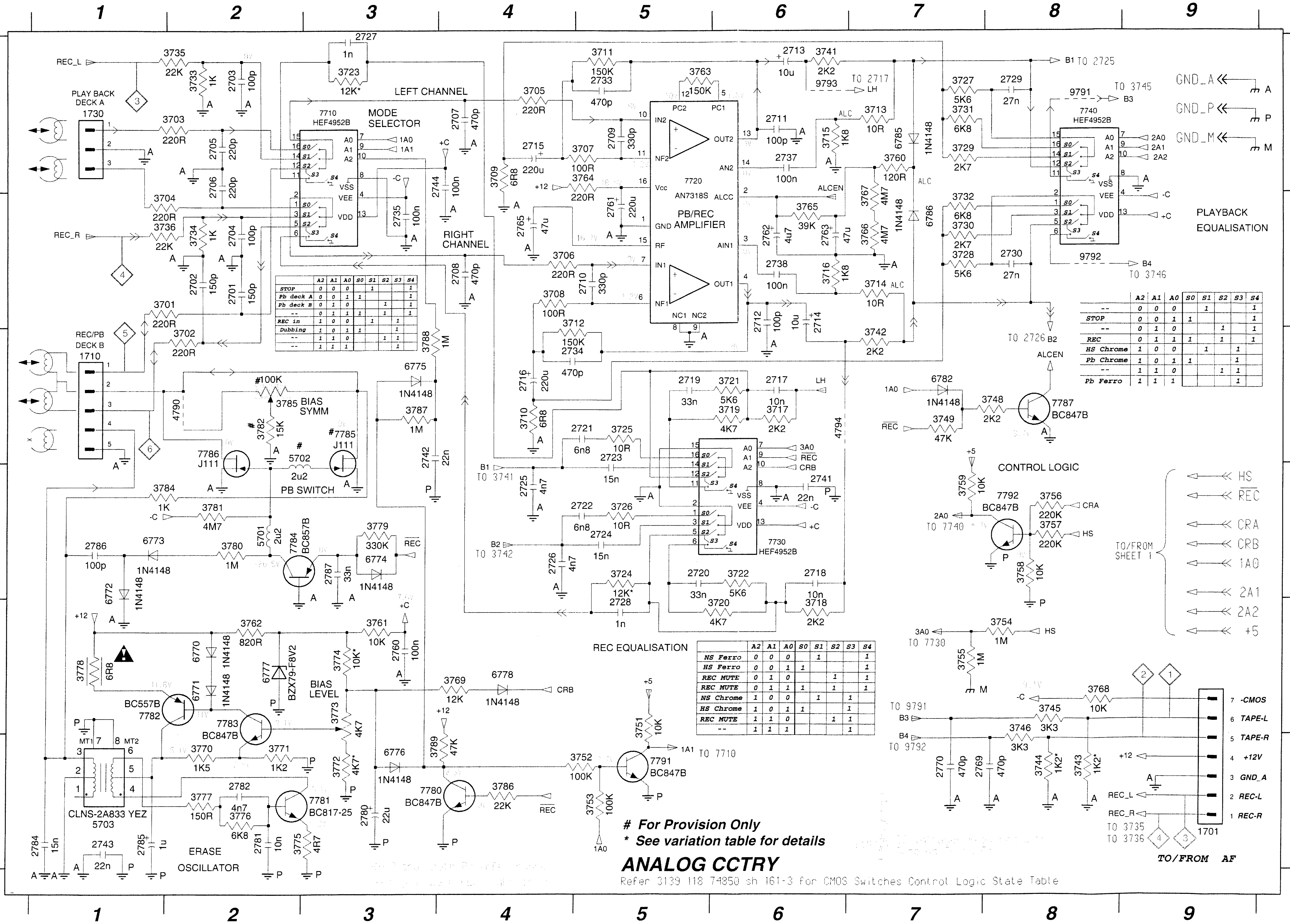
2735
4742
4737
3710
4735
3734
2704
3736
3781
3784
3702
4741
3701
3780
3714
4794
4790
2786
E
B
C

2621	A2	3680	A1	3779	C3	7730	B3
2622	A3	3686	A3	3780	C3	7740	B2
2623	A3	3701	C3	3781	C2	7780	A3
2624	A2	3702	C2	3782	B3	7781	B3
2625	A3	3703	C2	3784	C2	7783	B3
2701	C3	3704	C2	3786	A3	7784	C3
2702	C2	3705	C2	3787	A3	7787	C1
2703	C2	3706	C2	3788	C3	7791	A2
2704	C2	3707	C2	3789	B3	7792	A2
2705	C2	3708	C2	4701	A2		
2706	C2	3709	C2	4702	A2		
2707	C2	3710	C2	4703	A2		
2708	C2	3711	C2	4704	A1		
2709	C2	3712	C2	4705	A1		
2710	C2	3713	C1	4706	A1		
2711	C1	3714	C1	4707	A3		
2712	C1	3715	C1	4708	A3		
2717	B2	3716	C1	4709	B3		
2718	C3	3717	B2	4710	A3		
2719	B3	3718	C3	4711	A3		
2720	B3	3719	B3	4712	A2		
2721	B2	3720	B3	4713	A2		
2722	B2	3721	B3	4714	B2		
2723	B2	3722	B3	4715	A2		
2724	B3	3723	C3	4716	B2		
2725	B3	3724	B2	4717	B2		
2726	B3	3725	B2	4718	B2		
2727	C3	3726	B2	4719	B3		
2728	B2	3727	B2	4720	B2		
2729	B2	3728	B2	4721	B2		
2730	B2	3729	B2	4722	B2		
2731	B2	3730	B2	4723	B2		
2732	B2	3731	B2	4724	B2		
2733	C1	3732	B2	4725	B2		
2734	C1	3733	B2	4726	B2		
2735	C2	3734	C2	4727	B2		
2737	C1	3735	C2	4728	C2		
2738	C1	3736	C2	4729	C2		
2742	B3	3741	C2	4730	C2		
2743	C3	3742	C1	4731	C1		
2760	B3	3743	B1	4732	C3		
2769	B1	3744	B1	4733	C3		
2770	B1	3745	C1	4734	C2		
2781	C3	3746	C1	4735	C2		
2782	B3	3748	C1	4736	C2		
2786	C3	3749	B2	4737	C2		
2787	C3	3751	A2	4738	C1		
3601	A2	3752	A2	4739	C1		
3602	A2	3753	A2	4740	C1		
3603	A2	3754	A2	4741	C2		
3604	A2	3755	A2	4742	C2		
3605	A2	3756	A2	4781	A3		
3606	A1	3757	A2	4782	A3		
3608	A3	3758	A2	4783	A3		
3610	A3	3759	A2	4784	A1		
3612	A3	3760	B2	4790	C3		
3613	A2	3762	B3	4794	C1		
3614	A3	3763	C1	7610	A3		
3616	A3	3765	C1	7612	A1		
3618	A3	3766	C1	7613	A2		
3623	A1	3767	C1	7614	A1		
3624	A1	3768	C1	7616	A3		
3625	A1	3769	B3	7618	A1		
3626	A1	3770	B3	7619	A1		
3628	A1	3771	B3	7620	A1		
3630	A1	3772	A3	7622	A2		
3672	A3	3774	B3	7623	A2		
3676	A2	3775	C3	7624	A3		
3678	A1	3776	B3	7710	C2		
3679	A1	3777	B3	7720	C2		

ANALOG CIRCUIT


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1710
7710 HEF4952B
MODE SELECTOR
LEFT CHANNEL
RIGHT CHANNEL
PB/REC AMPLIFIER
7720 AN7318S
IN2
NF2
Vcc
GND
RF
IN1
NF1
NC1
NC2
PC2
PC1
OUT2
AN2
ALCC
AIN1
OUT1
ALCEN
ALC
7740 HEF4952B
PLAYBACK EQUALISATION
GND_A
GND_P
GND_M
B1 TO 2725
TO 3745 B3
B4 TO 3746
TO 2717 LH
TO 2726 B2
ALCEN
7787 BC847B
CONTROL LOGIC
7792 BC847B
2A0 TO 7740
CRA
HS
TO/FROM SHEET 1
HS
REC
CRA
CRB
1A0
2A1
2A2
+5
7730 HEF4952B
REC EQUALISATION
B1 TO 3741
B2 TO 3742
3A0
REC
CRB
BIAS SYMM
#100K
3785
PB SWITCH
7786 J111
#7785 J111
5702 2u2
7784 BC857B
BIAS LEVEL
7782 BC557B
7783 BC847B
7781 BC817-25
7780 BC847B
7791 BC847B
1A1 TO 7710
BZX79-F8V2
CLNS-2A833 YEZ 5703
MT1
MT2
ERASE OSCILLATOR
3A0 TO 7730
TO 9791 B3
B4 TO 9792
-CMOS
TAPE-L
TAPE-R
+12V
GND_A
REC-L
REC-R
1701
TO 3735
TO 3736
TO/FROM AF

For Provision Only

* See variation table for details

ANALOG CCTRY

Refer 3139 118 74850 sh 161-3 for CMOS Switches Control Logic State Table

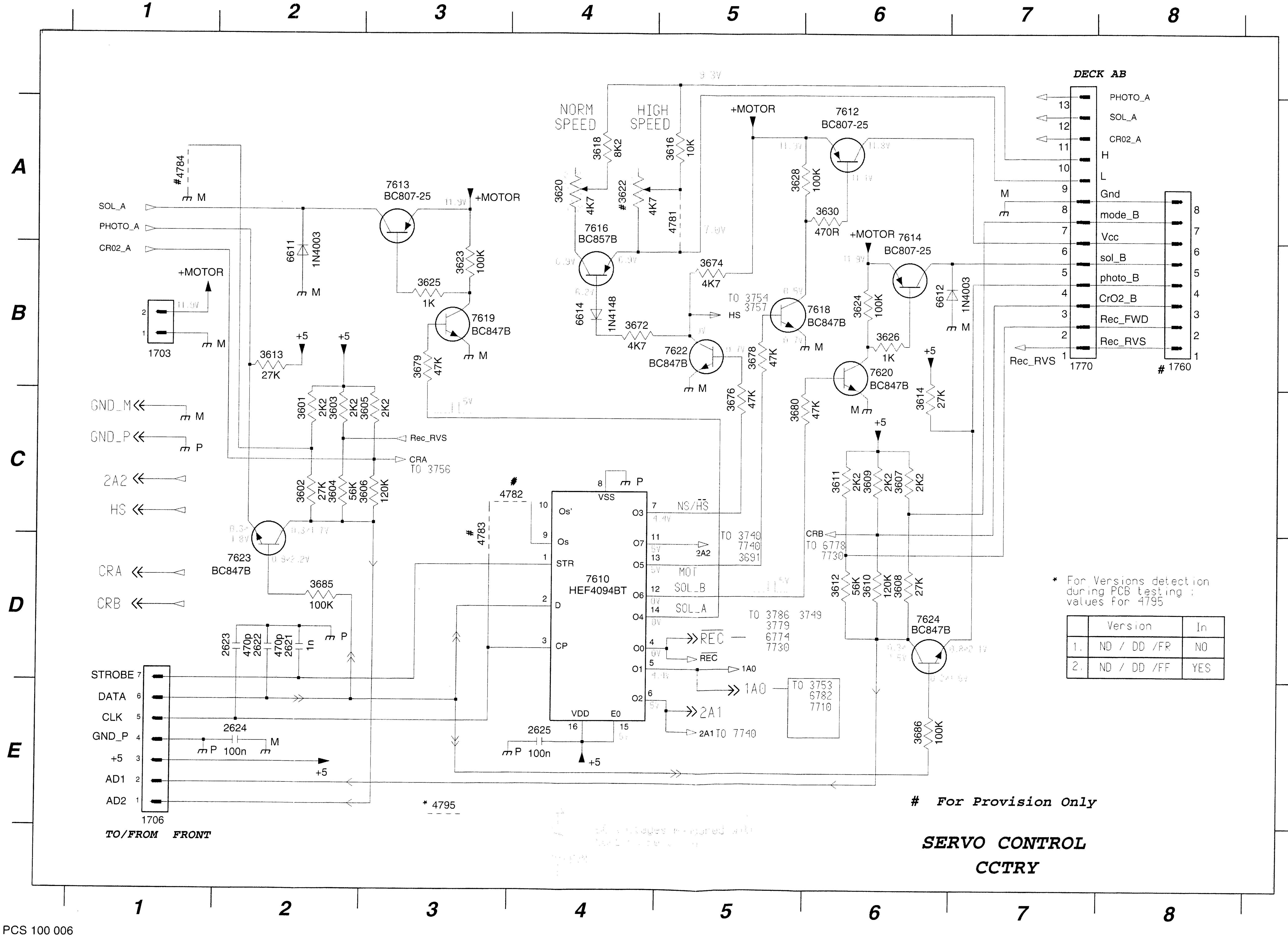
	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

1701	*F9*
1710	*C1*
1730	*A1*
2701	*B2*
2702	*B2*
2703	*A2*
2704	*B2*
2705	*A2*
2706	*A2*
2707	*A4*
2708	*B4*
2709	*A5*
2710	*B5*
2711	*A6*
2712	*B6*
2713	*A6*
2714	*B6*
2715	*A4*
2716	*C4*
2717	*C6*
2718	*D6*
2719	*C5*
2720	*D5*
2721	*C5*
2722	*D5*
2723	*C5*
2724	*D5*
2725	*D4*
2726	*D4*
2727	*A3*
2728	*E5*
2729	*A8*
2730	*B8*
2733	*A5*
2734	*C4*
2735	*B3*
2737	*A6*
2738	*B6*
2741	*D6*
2742	*C3*
2743	*F1*
2744	*A3*
2760	*E3*
2761	*B5*
2762	*B6*
2763	*B6*
2765	*B4*
2769	*F7*
2770	*F7*
2780	*F3*
2781	*F2*
2782	*F2*
2784	*F1*
2785	*F1*
2786	*D1*
2787	*D3*
3701	*B1*
3702	*C2*
3703	*A2*
3704	*B1*
3705	*A4*
3706	*B4*
3707	*A5*
3708	*B4*
3709	*A4*
3710	*C4*
3711	*A5*
3712	*B4*
3713	*A7*
3714	*B7*
3715	*A6*
3716	*B6*
3717	*C6*
3718	*E6*
3719	*C6*
3720	*E6*
3721	*C6*
3722	*D6*
3723	*A3*
3724	*D5*
3725	*C5*
3726	*D5*
3727	*A7*
3728	*B7*
3729	*A7*
3730	*B7*
3731	*A7*
3732	*B7*
3733	*A2*
3734	*B2*
3735	*A2*
3736	*B1*
3741	*A6*
3742	*C7*
3743	*F8*
3744	*F8*
3745	*E8*
3746	*E8*
3748	*C8*
3749	*C7*
3751	*E5*
3752	*F5*
3753	*F5*
3754	*E8*
3755	*E7*
3756	*D8*
3757	*D8*
3758	*D8*
3759	*D7*
3760	*A7*
3761	*E3*
3762	*E2*
3763	*A5*
3764	*A5*
3765	*B6*
3766	*B7*
3767	*B7*
3768	*E8*
3769	*E4*
3770	*F2*
3771	*F2*
3772	*F3*
3773	*E3*
3774	*E3*
3775	*F2*
3776	*F2*
3777	*F2*
3778	*E1*
3779	*D3*
3780	*D2*
3781	*D2*
3782	*C2*
3784	*D1*
3785	*C2*
3786	*F4*
3787	*C3*
3788	*C3*
3789	*F3*
4790	*C2*
4794	*C6*
5701	*D2*
5702	*C2*
5703	*F1*
6770	*E2*
6771	*E2*
6772	*D1*
6773	*D1*
6774	*D3*
6775	*C3*
6776	*F3*
6777	*E2*
6778	*E4*
6782	*C7*
6785	*A7*
6786	*B7*
7710	*A3*
7720	*A5*
7730	*D6*
7740	*A8*
7780	*F4*
7781	*F3*
7782	*E1*
7783	*E2*
7784	*D2*
7785	*C3*
7786	*C2*
7787	*C8*
7791	*F5*
7792	*D8*
9791	*A8*
9792	*B8*
9793	*A6*

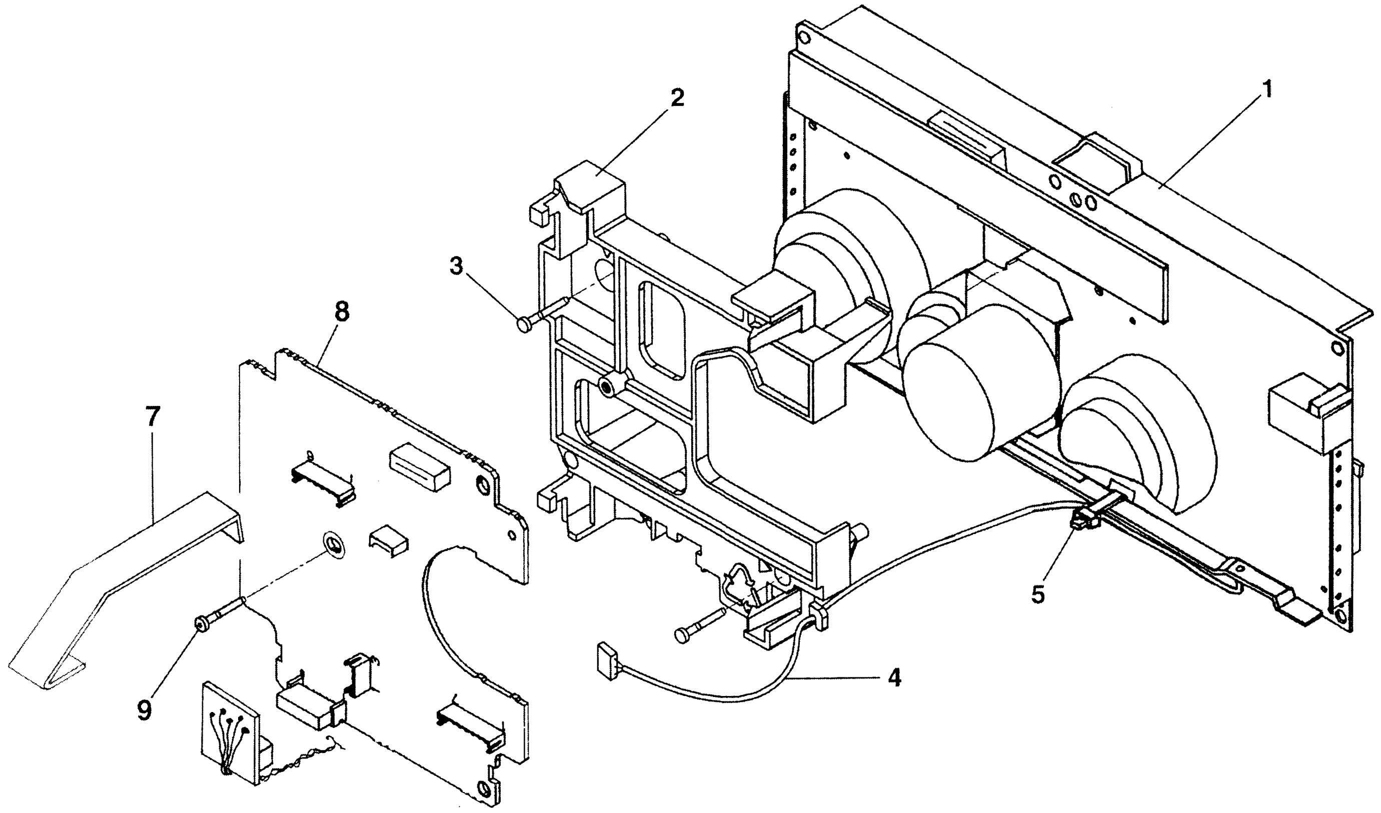
SERVO CONTROL CIRCUIT


1
2
3
4
5
6
7
8
A
B
C
D
E
DECK AB
PHOTO_A
SOL_A
CR02_A
H
L
Gnd
mode_B
Vcc
sol_B
photo_B
CrO2_B
Rec_FWD
Rec_RVS
1770
# 1760
Rec_RVS
M
NORM SPEED
HIGH SPEED
3.3V
+MOTOR
7612
BC807-25
3628
100K
3630
470R
+MOTOR
7614
BC807-25
6612
1N4003
M
3624
100K
3626
1K
+5
3614
27K
7620
BC847B
M
+5
3618
8K2
3616
10K
3620
4K7
# 3622
4K7
4781
7616
BC857B
6614
1N4148
3672
4K7
3674
4K7
TO 3754
3757
HS
7618
BC847B
M
7622
BC847B
M
3678
47K
3676
47K
3680
47K
# 4784
M
SOL_A
PHOTO_A
CR02_A
7613
BC807-25
+MOTOR
6611
1N4003
M
3623
100K
3625
1K
7619
BC847B
M
3679
47K
+MOTOR
1703
M
3613
27K
+5
+5
3601
2K2
3603
2K2
3605
2K2
Rec_RVS
CRA
TO 3756
3602
27K
3604
56K
3606
120K
GND_M
M
GND_P
P
2A2
HS
CRA
CRB
7623
BC847B
3685
100K
#
4782
#
4783
8
P
VSS
10
Os'
9
Os
1
STR
2
D
3
CP
7610
HEF4094BT
VDD
E0
16
15
O3
7
NS/HS
O7
11
13
2A2
O5
MOT
O6
12
SOL_B
O4
14
SOL_A
O0
4
REC
REC
O1
5
1A0
1A0
O2
6
2A1
2A1 TO 7740
TO 3740
7740
3691
TO 3786 3749
3779
6774
7730
TO 3753
6782
7710
CRB
TO 6778
7730
+5
3611
2K2
3609
2K2
3607
2K2
3612
56K
3610
120K
3608
27K
7624
BC847B
3686
100K
2623
470p
2622
470p
2621
1n
P
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
TO/FROM FRONT
2624
100n
P
M
+5
2625
100n
P
+5
* 4795
# For Provision Only
SERVO CONTROL
CCTRY

* For Versions detection during PCB testing : values for 4795

	Version	In
1.	ND / DD /FR	NO
2.	ND / DD /FF	YES

1703	B1
1706	E1
1760	B8
1770	B7
2621	D2
2622	D2
2623	D2
2624	E2
2625	E4
3601	C2
3602	C2
3603	C2
3604	C2
3605	C3
3606	C3
3607	C6
3608	D6
3609	C6
3610	D6
3611	C6
3612	D6
3613	B2
3614	C6
3616	A5
3618	A4
3620	A4
3622	A4
3623	B3
3624	B6
3625	B3
3626	B6
3628	A5
3630	A6
3672	B4
3674	B5
3676	C5
3678	B5
3679	B3
3680	C5
3685	D2
3686	E6
4781	A5
4782	C4
4783	C3
4784	A1
4795	E3
6611	B2
6612	B6
6614	B4
7610	D4
7612	A6
7613	A3
7614	A6
7616	A4
7618	B6
7619	B3
7620	B6
7622	B5
7623	D2
7624	D6



ETF6 TAPE MODULE EXPLODED VIEW

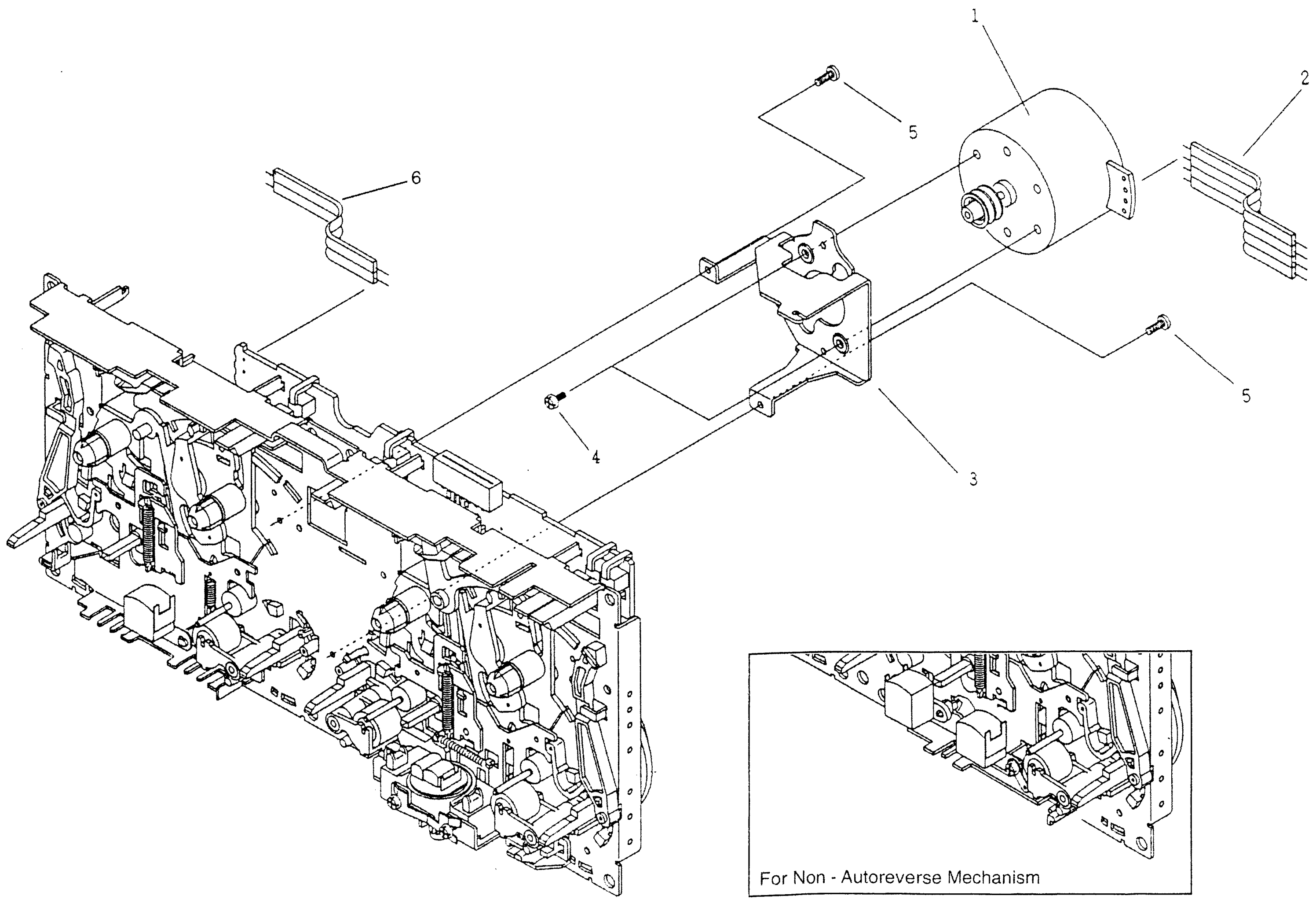
1	4822 691 10673	Autoreverse Mech. CWC44FR02
1	4822 691 10672	Non-Autoreverse Mech. CWC44FF01
3	-	Screw M2 x 16
7	4822 320 12245	Flex Cable 13 pin 7,5 cm
9	-	Screw D3 x 10

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM - MOTOR EXPLODED VIEW

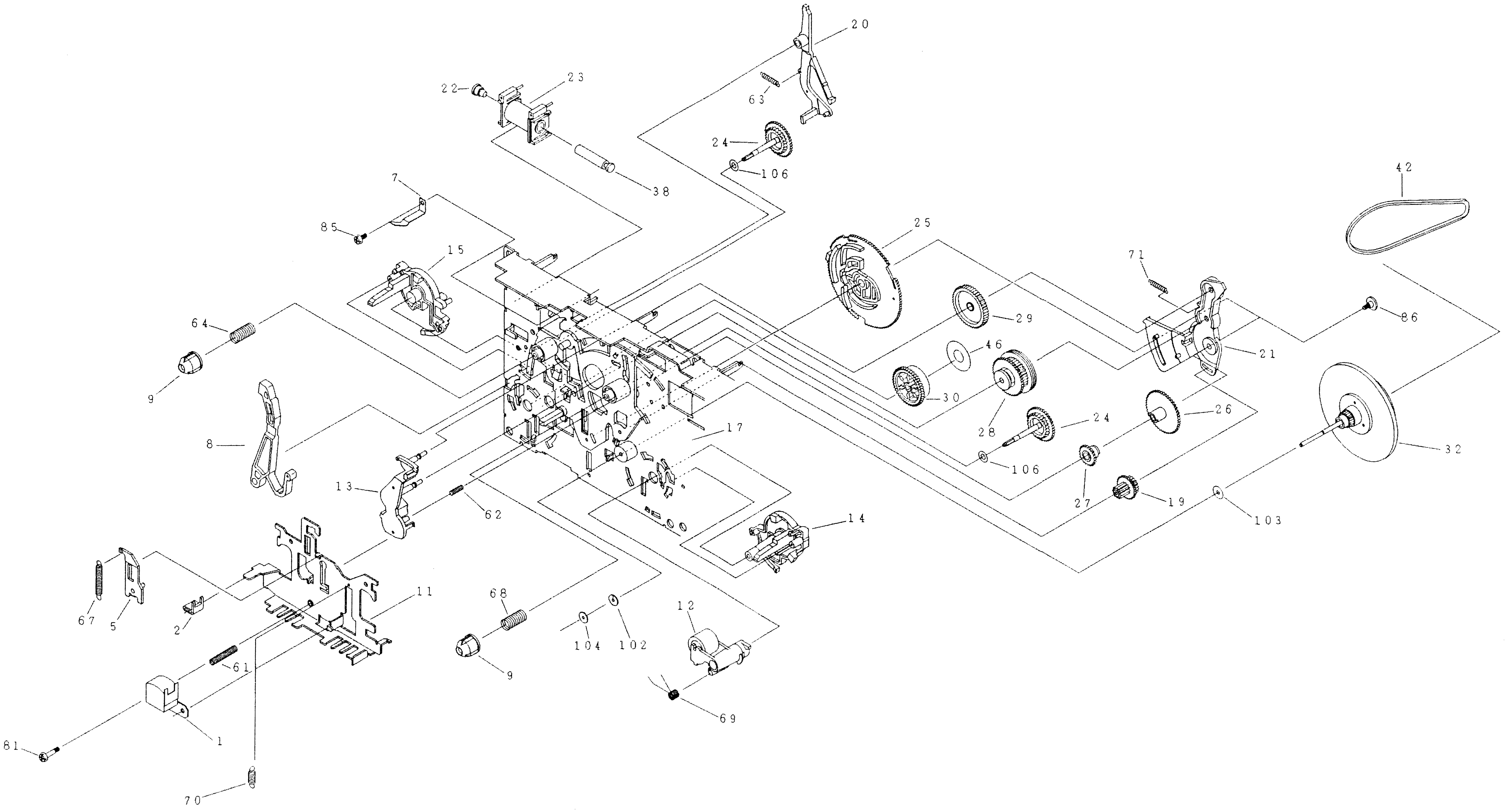
1	4822 361 11055	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.



For Non - Autoreverse Mechanism

TAPE MECHANISM A - PLAY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103
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104
102
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81
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70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
42	4822 358 10168	Belt AF
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in this list are normal service spare parts.

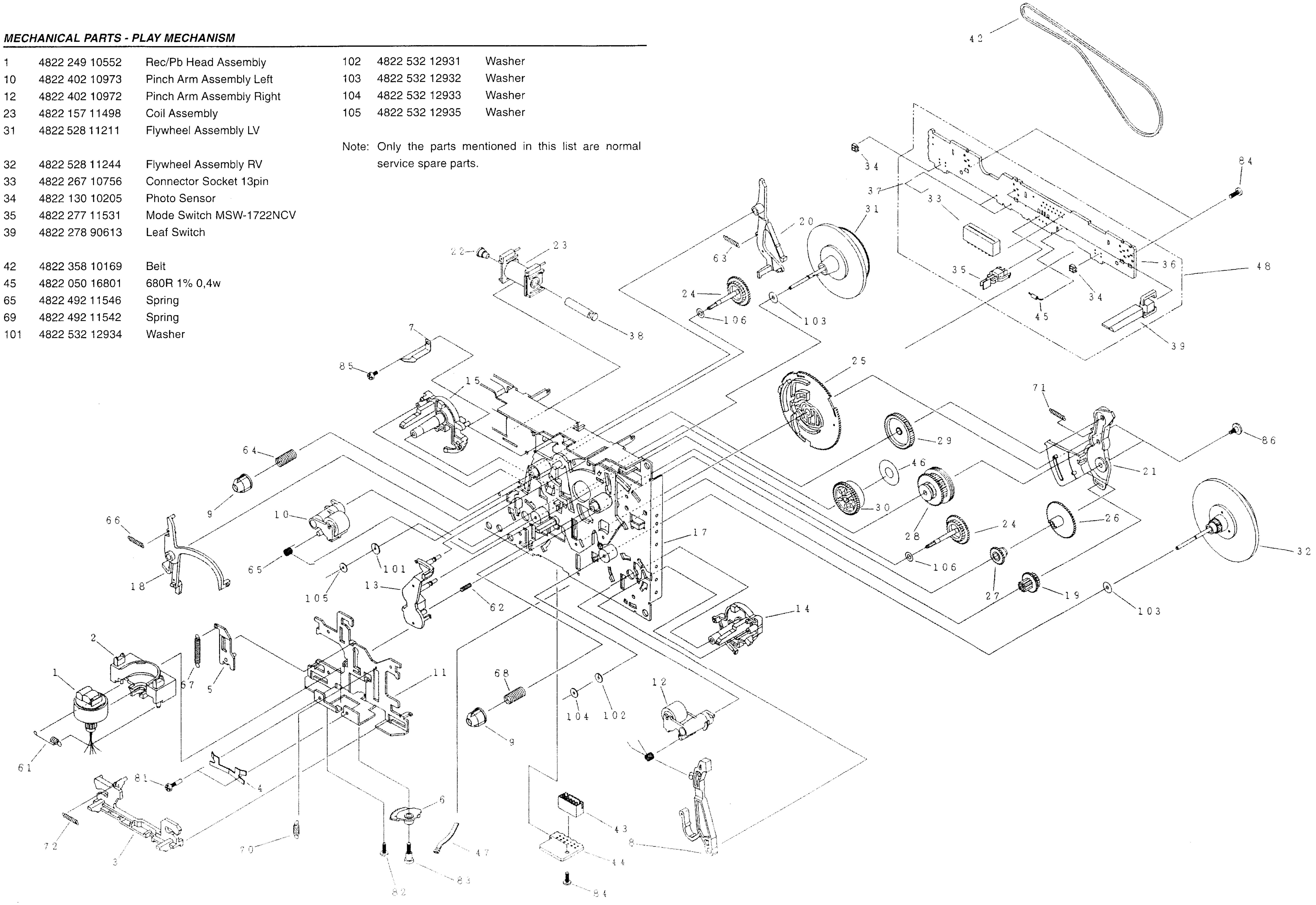
TAPE MECHANISM B - RECORD/PLAYBACK

(Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10552	Rec/Pb Head Assembly
10	4822 402 10973	Pinch Arm Assembly Left
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
31	4822 528 11211	Flywheel Assembly LV
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.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101
106
105
13
18
62
27
19
103
14
2
1
67
5
11
68
104
102
12
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61
81
4
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72
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43
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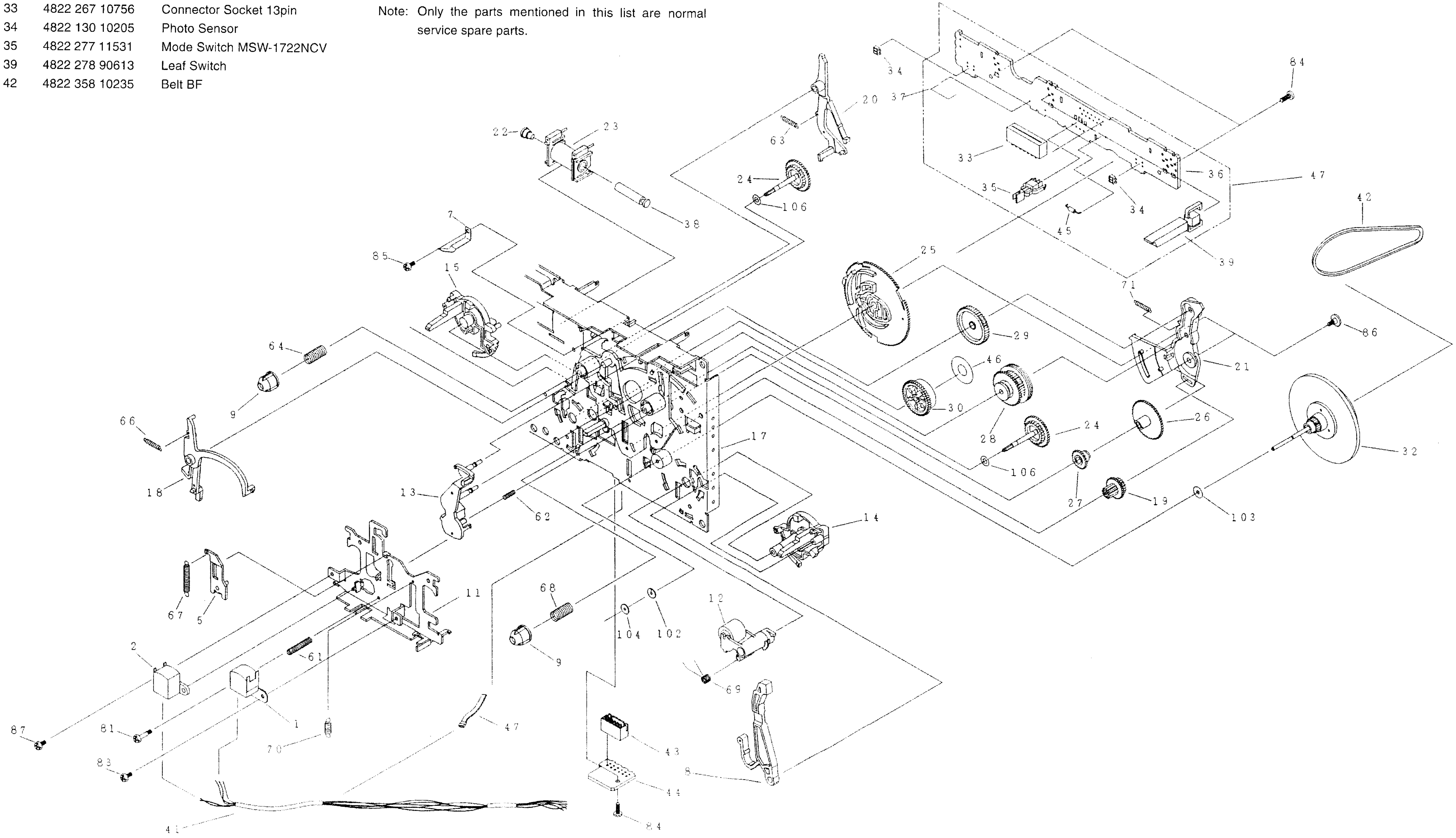
83
84

TAPE MECHANISM B - RECORD/PLAYBACK
(Non-Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	Rec/Pb Head Assembly
2	4822 249 40303	Erase Head
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10235	Belt BF
45	4822 050 16801	680R 1% 0,4w
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in this list are normal service spare parts.



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106
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15
25
71
29
86
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21
64
30
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28
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66
17
32
106
13
18
27
19
103
62
14
11
67
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68
12
2
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104
102
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84

ELECTRICAL PARTS LIST - ETF6 NON-DOLBY BOARD

MISCELLANEOUS

1770	4822 267 10738	Flex Cable Socket 13Pin

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	5322 122 34099	470pF 10% 63V
2624	4822 126 13296	100nF 10% 16V
2625	4822 126 13296	100nF 10% 16V
2701	5322 122 33538	150pF 2% 63V
2702	5322 122 33538	150pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	4822 122 33575	220pF 5% 50V
2706	4822 122 33575	220pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 40196	220µF 20% 16V
2716	4822 124 40196	220µF 20% 16V
2717	4822 122 33177	10nF 20% 50V
2718	4822 122 33177	10nF 20% 50V
2719	4822 126 12105	33nF 5% 63V
2720	4822 126 12105	33nF 5% 63V
2721	5322 122 31866	6,8nF 10% 63V
2722	5322 122 31866	6,8nF 10% 63V
2723	4822 126 13188	15nF 5% 63V
2724	4822 126 13188	15nF 5% 63V
2725	5322 126 10223	4,7nF 10% 63V
2726	5322 126 10223	4,7nF 10% 63V
2727	5322 122 34123	1nF 10% 50V
2728	5322 122 34123	1nF 10% 50V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13296	100nF 10% 16V
2737	4822 126 13296	100nF 10% 16V
2738	4822 126 13296	100nF 10% 16V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	5322 122 32654	22nF 10% 63V
2744	4822 126 13296	100nF 10% 16V
2760	4822 126 13296	100nF 10% 16V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40246	4,7µF 20% 63V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 63V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 051 20563	56k 5% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 051 20563	56k 5% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3616	4822 117 10833	10k 1% 0,1W
3618	4822 051 20822	8k2 5% 0,1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3701	4822 117 11503	220R 1% 0.1W
3702	4822 117 11503	220R 1% 0.1W
3703	4822 117 11503	220R 1% 0.1W
3704	4822 117 11503	220R 1% 0.1W
3705	4822 117 11503	220R 1% 0.1W
3706	4822 117 11503	220R 1% 0.1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W
3709	4822 051 20688	6R8 5% 0,1W
3710	4822 051 20688	6R8 5% 0,1W

ELECTRICAL PARTS LIST - ETF6 NON-DOLBY BOARD

3711	4822 051 20154	150k 5% 0,1W
3712	4822 051 20154	150k 5% 0,1W
3713	4822 051 20109	10R 5% 0,1W
3714	4822 051 20109	10R 5% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 117 11449	2k2 1% 0,1W
3718	4822 117 11449	2k2 1% 0,1W
3719	4822 051 20472	4k7 5% 0,1W
3720	4822 051 20472	4k7 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W For Autoreverse
3723	4822 051 20153	15k 5% 0,1W For Non-autorev.
3724	4822 117 11383	12k 1% 0,1W For Autoreverse
3724	4822 051 20153	15k 5% 0,1W For Non-autorev.
3725	4822 051 20109	10R 5% 0,1W
3726	4822 051 20109	10R 5% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 117 11507	6k8 1% 0,1W
3732	4822 117 11507	6k8 1% 0,1W
3733	4822 051 10102	1k 2% 0,25W
3734	4822 051 10102	1k 2% 0,25W
3735	4822 051 20223	22k 5% 0,1W
3736	4822 051 20223	22k 5% 0,1W
3741	4822 117 11449	2k2 1% 0,1W
3742	4822 117 11449	2k2 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W For Autoreverse
3743	4822 051 10102	1k 2% 0,25W For Non-autorev.
3744	4822 051 20122	1k2 5% 0,1W For Autoreverse
3744	4822 051 10102	1k 2% 0,25W For Non-autorev.
3745	4822 051 20332	3k3 5% 0,1W
3746	4822 051 20332	3k3 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20105	1M 5% 0,1W
3755	4822 051 20105	1M 5% 0,1W
3756	4822 051 20224	220k 5% 0,1W
3757	4822 051 20224	220k 5% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 11383	12k 1% 0,1W
3769	4822 051 20822	8k2 5% 0,1W
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20472	4k7 5% 0,1W For Autoreverse
3772	4822 051 20562	5k6 5% 0,1W For Non-autorev.
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 117 10833	10k 1% 0,1W For Autoreverse
3774	4822 051 20822	8k2 5% 0,1W For Non-autorev.
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688 △	6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3784	4822 051 10102	1k 2% 0,25W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805
4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF6 NON-DOLBY BOARD

RESISTORS

4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4781	4822 051 20008	0R Jumper 0805
4790	4822 051 20008	0R Jumper 0805
4794	4822 051 20008	0R Jumper 0805
4795	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5701	4822 156 21721	Coil 2,2µH 10%
5703	4822 156 20946	Osc Coil 100kHz

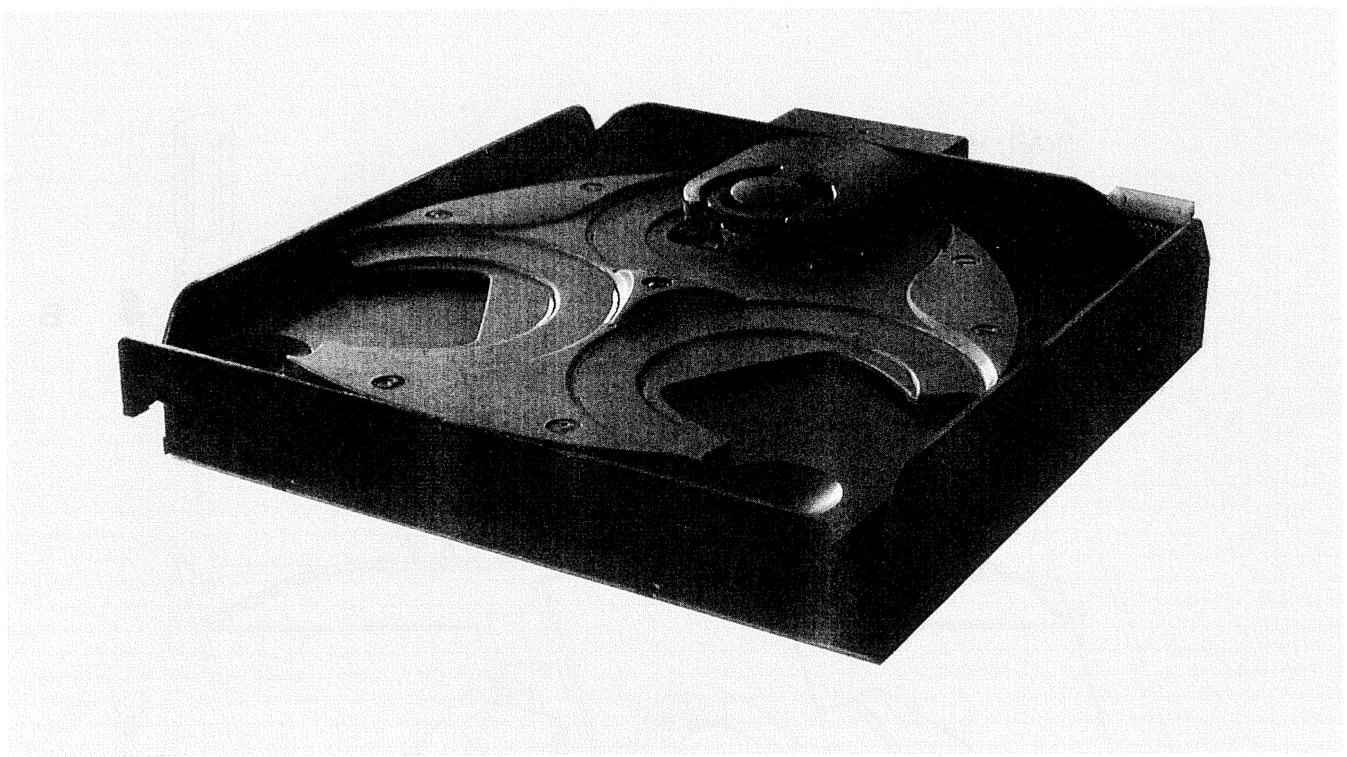
DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-F8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 42804	BC817-25
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.



3CDC Module

(3 Disc Carrousel Changer)

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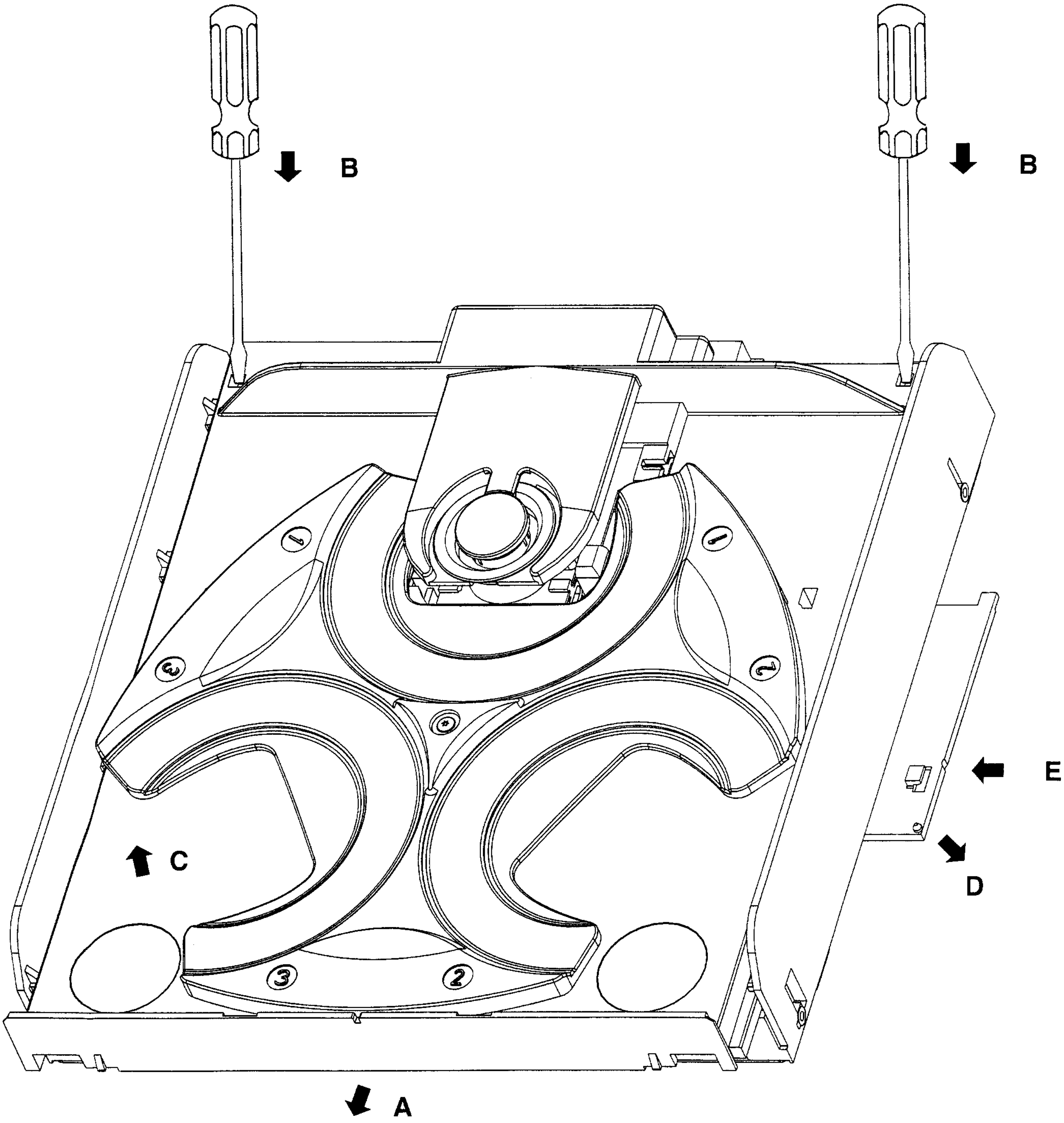
Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

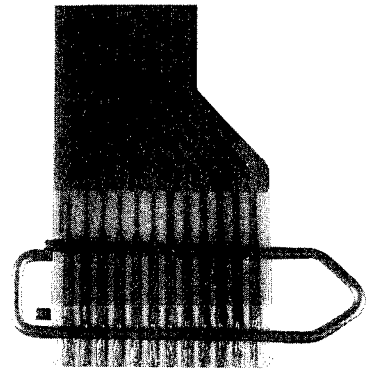
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

Replacement of CD Drive

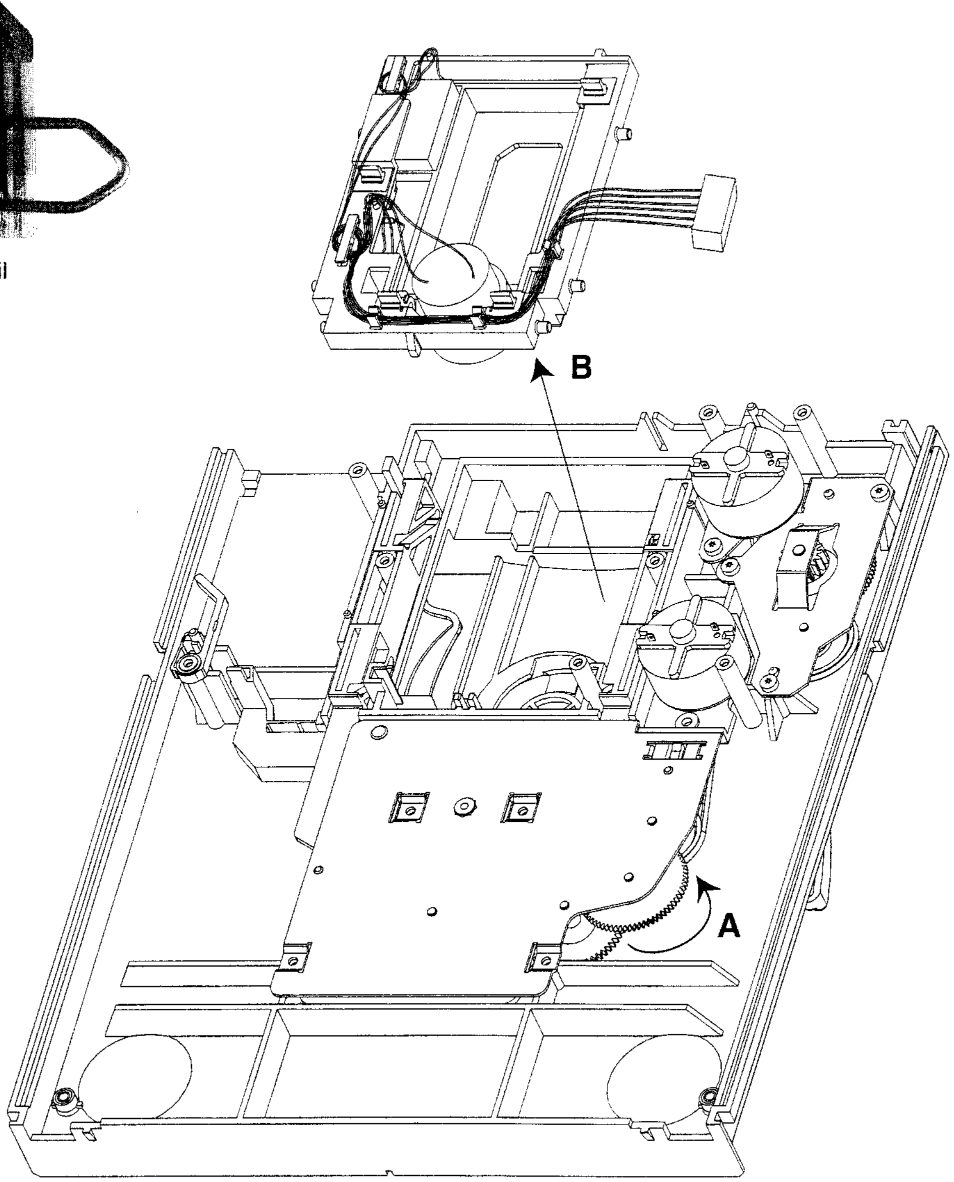
See also exploded view of changer mechanism.

1. Demount flex plate (pos 140).
2. Demount printed circuit board: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.



CD drive flex foil

4. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
5. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
6. Demount CD drive support (pos 95) Ⓑ.
7. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.

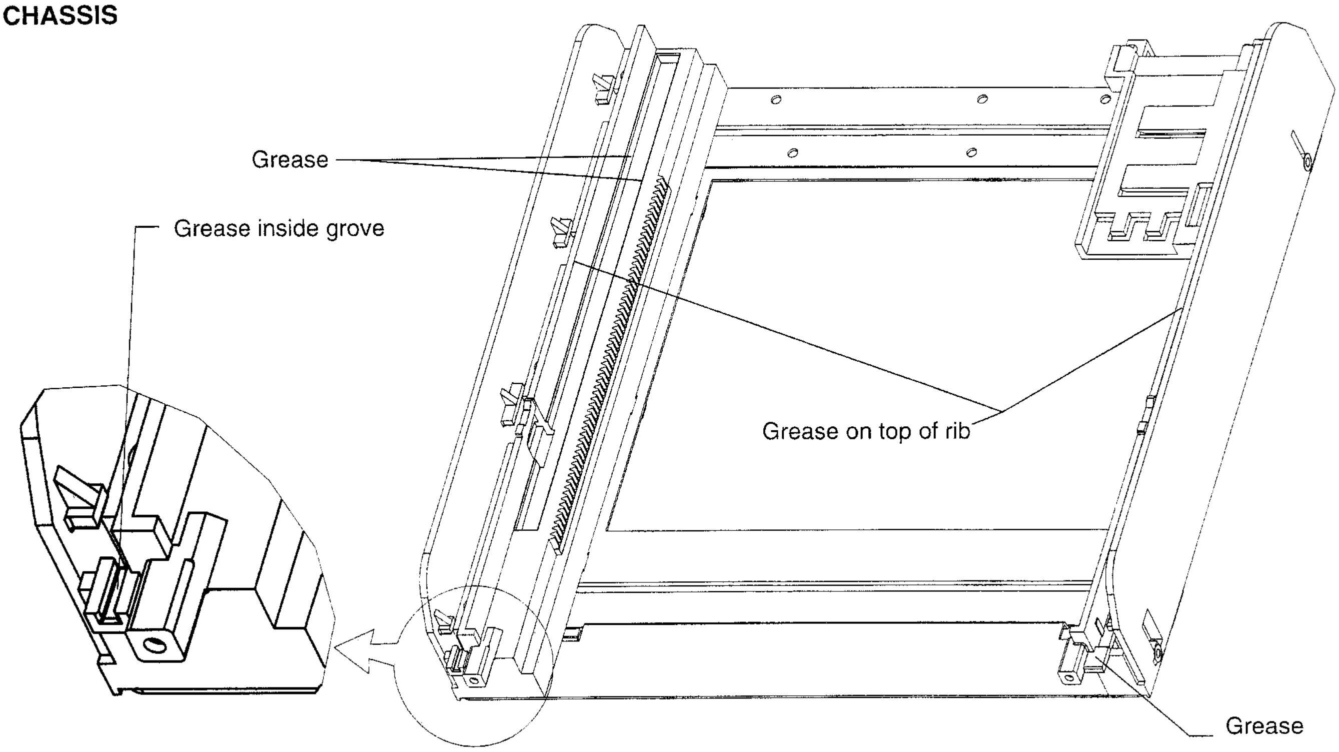


Mounting of Carrousel

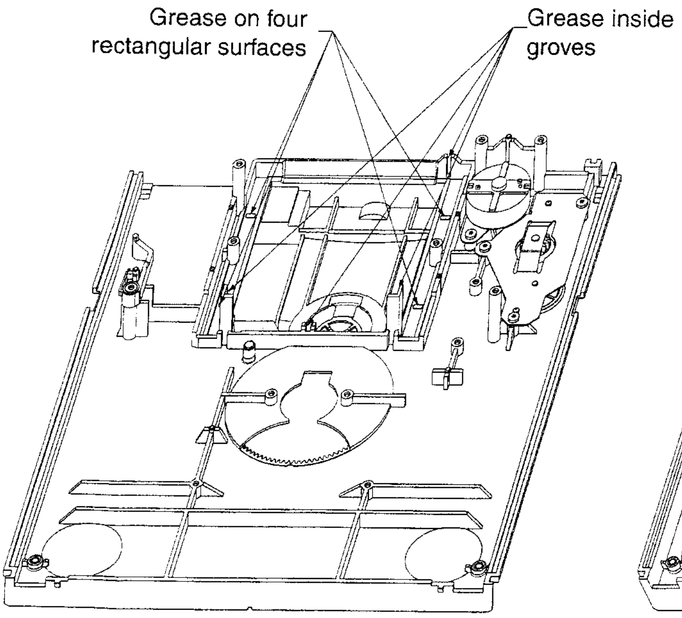
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

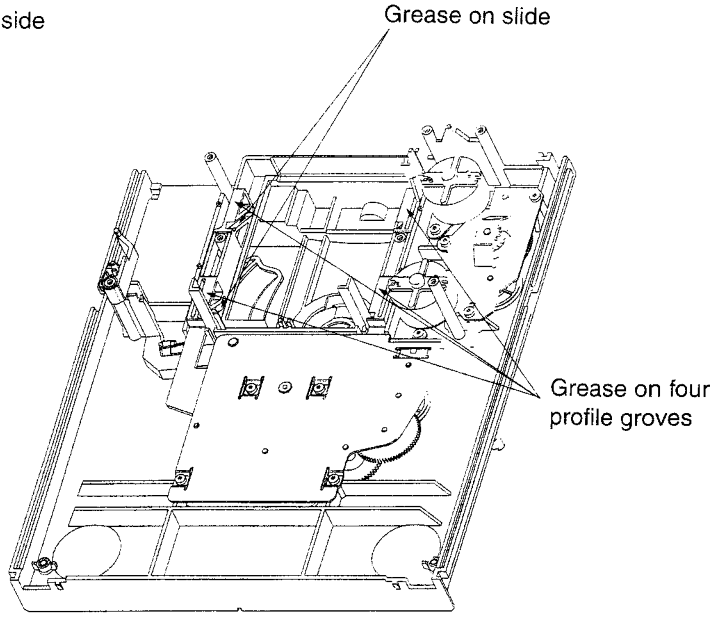
Lubrication Instructions

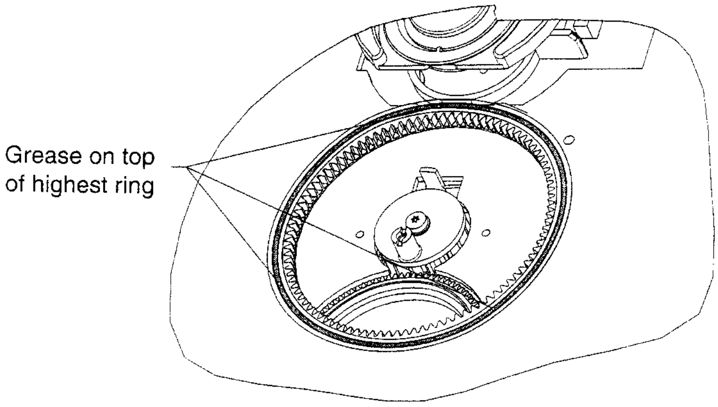
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

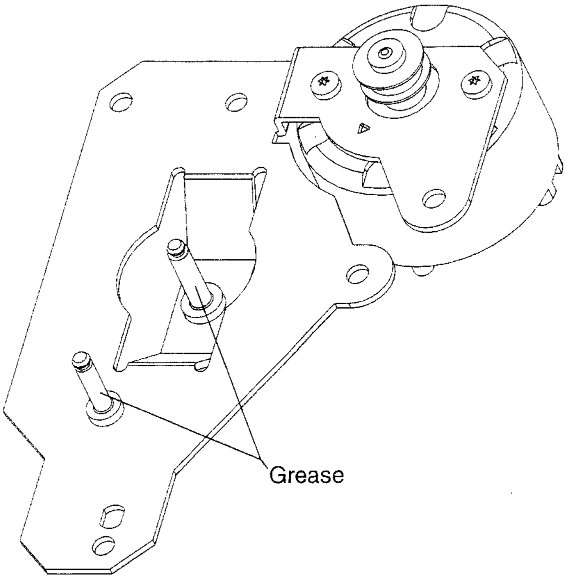
DRAWER


Grease on four rectangular surfaces
Grease inside groves

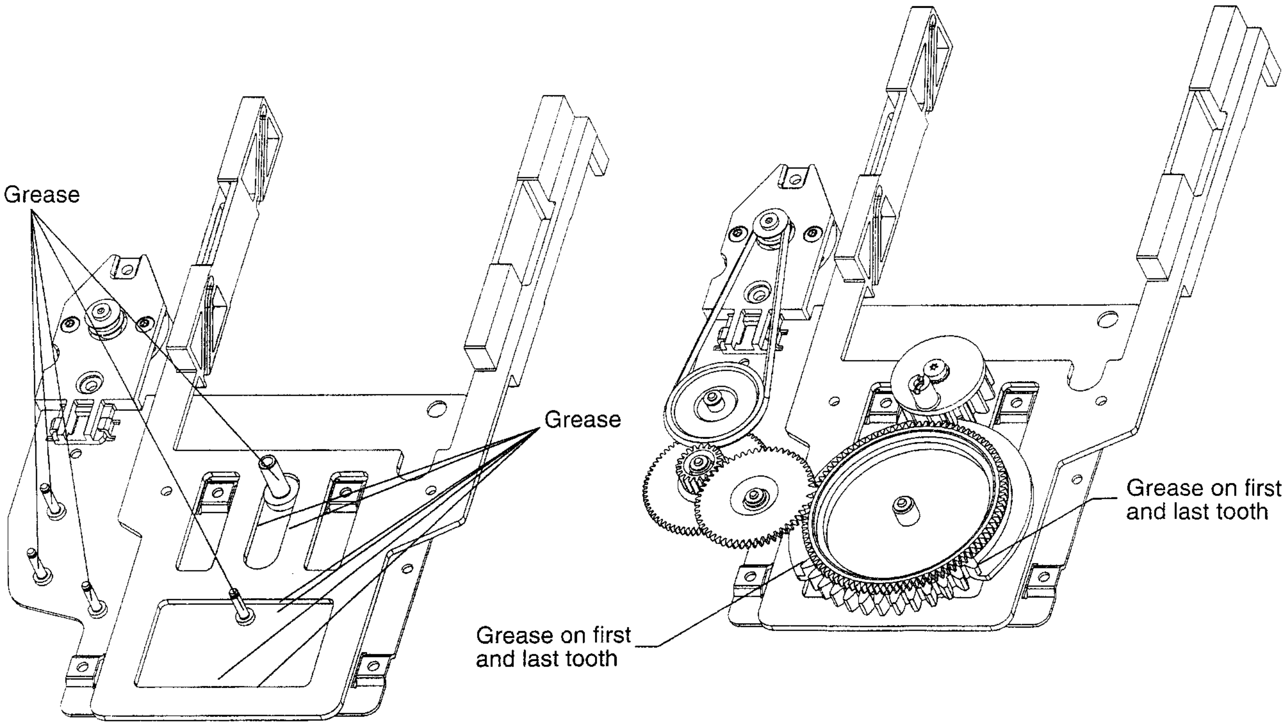

Grease on slide
Grease on four profile groves


Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first
and last tooth
Grease on first
and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
- *SWITCH OFF POWER SUPPLY*
- *ESD PROTECTION*

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

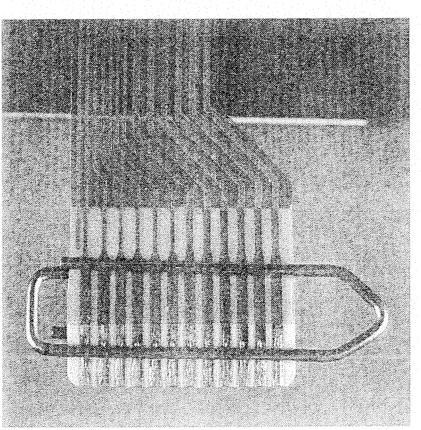


fig.1

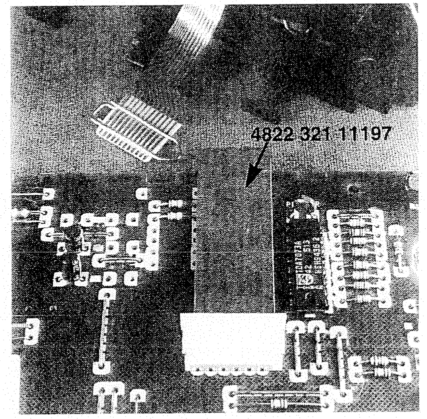


fig.2

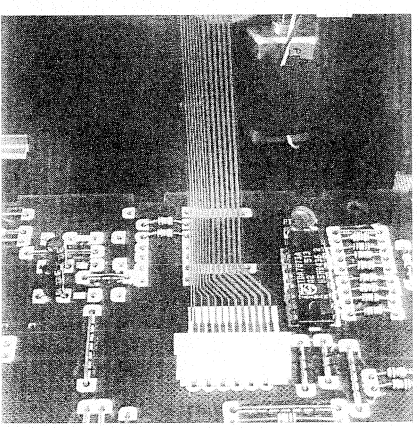
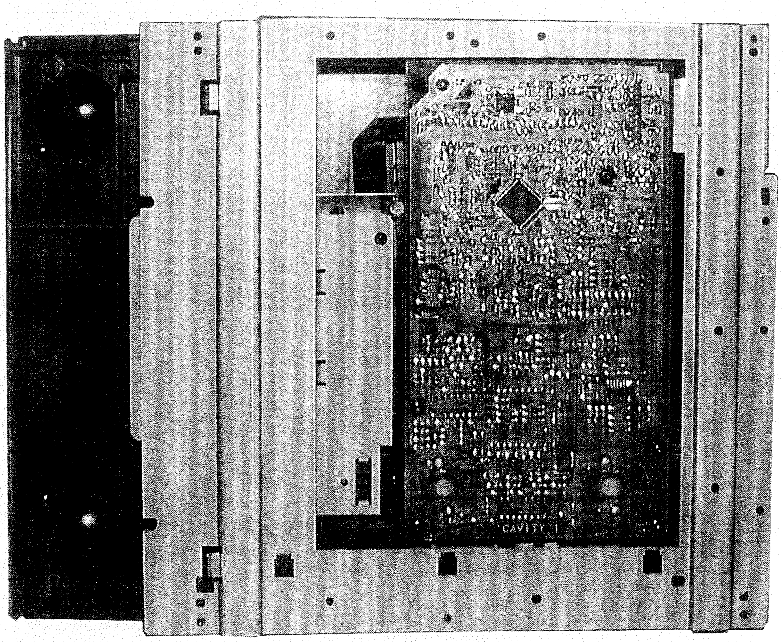
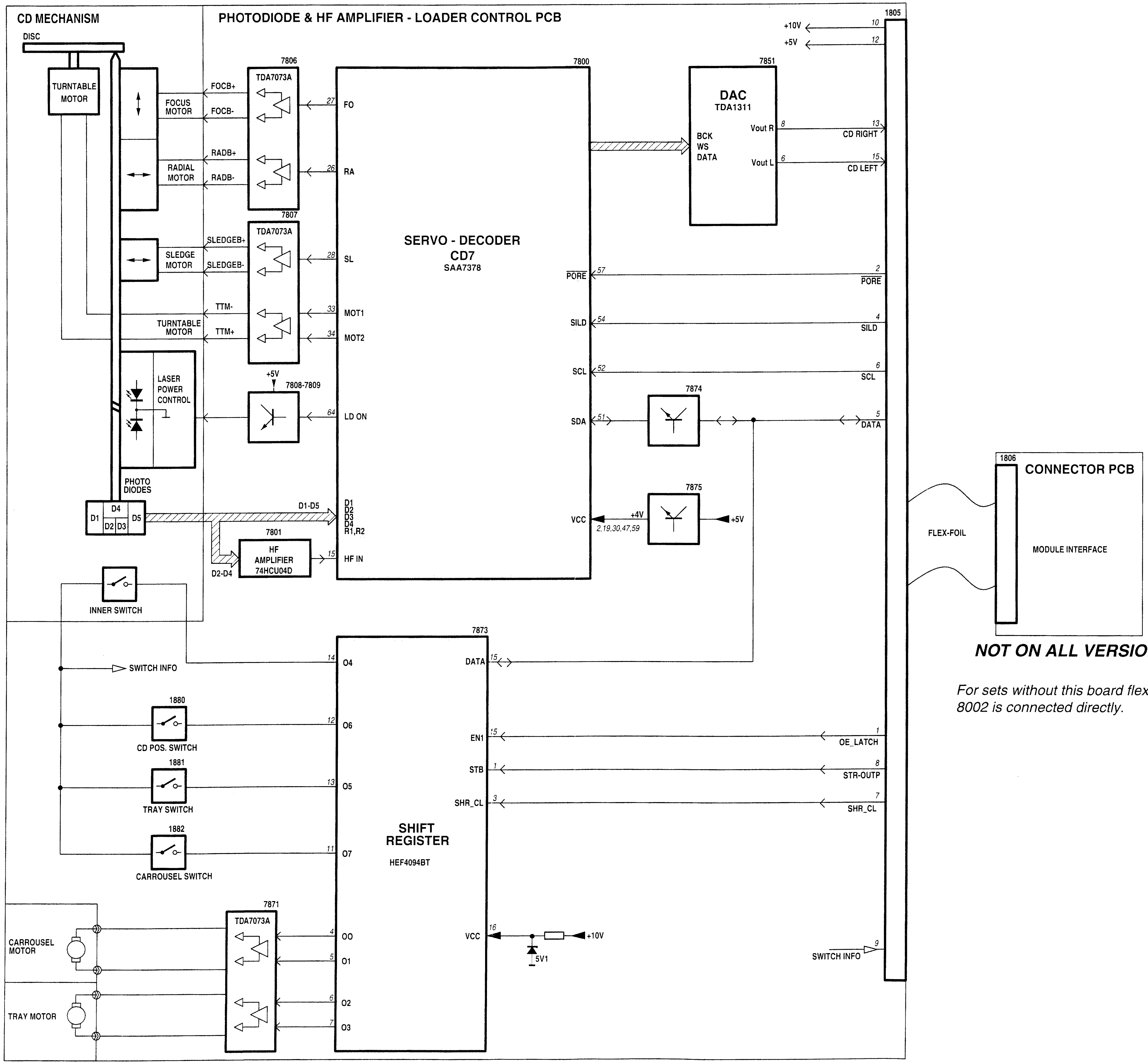


fig.3

Service Position



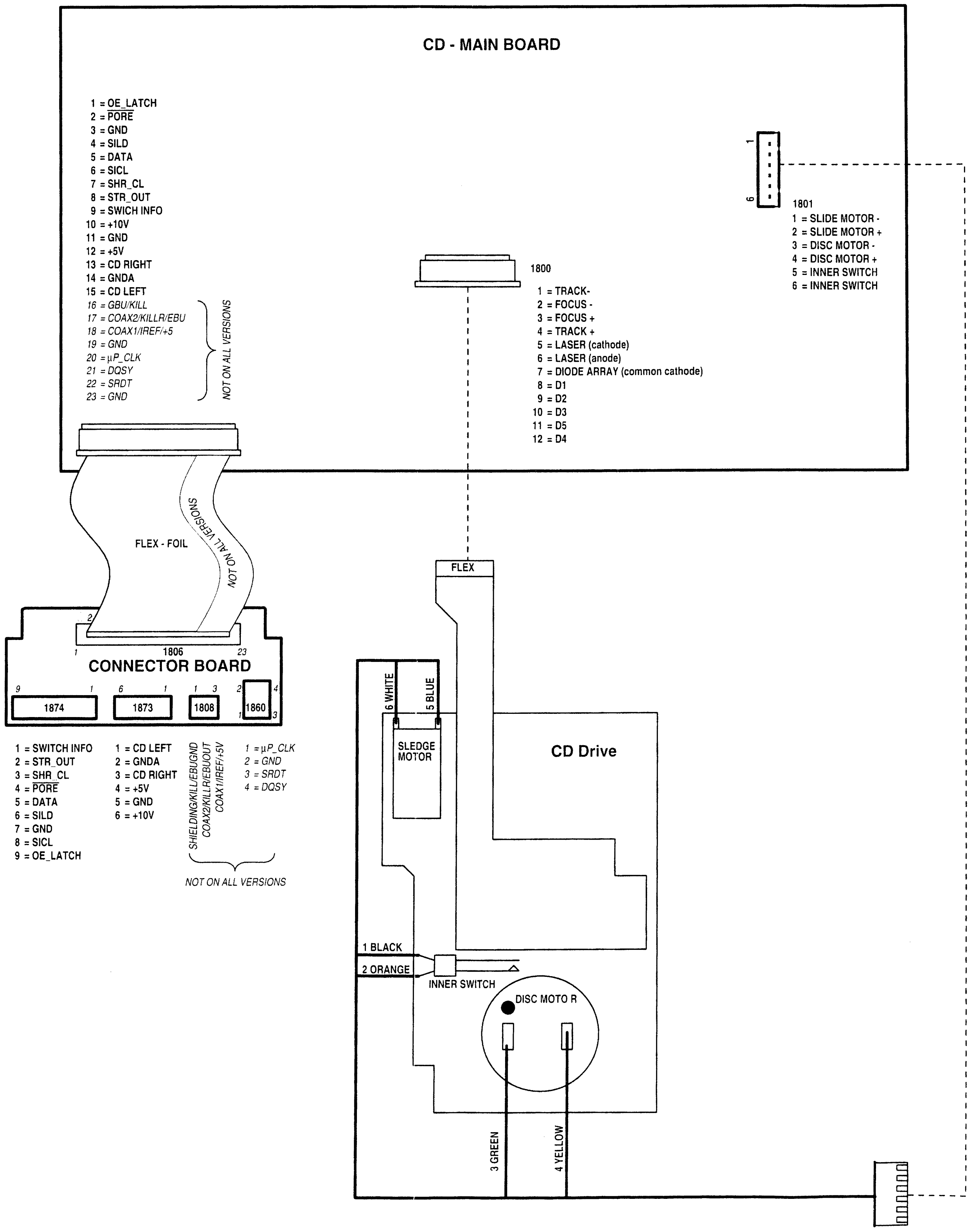
Blockdiagram


CD MECHANISM
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER POWER CONTROL
PHOTO DIODES
D1
D4
D5
D2
D3
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
FOCB+
FOCB-
RADB+
RADB-
SLEDGEB+
SLEDGEB-
TTM-
TTM+
7806
TDA7073A
7807
TDA7073A
+5V
7808-7809
D1-D5
D2-D4
7801
HF AMPLIFIER 74HCU04D
7800
27 FO
26 RA
28 SL
33 MOT1
34 MOT2
64 LD ON
D1 D2 D3 D4 R1,R2
15 HF IN
SERVO - DECODER
CD7
SAA7378
PORE 57
SILD 54
SCL 52
SDA 51
VCC
+4V
2,19,30,47,59
7874
7875
+5V
7851
DAC
TDA1311
BCK
WS
DATA
Vout R 8
Vout L 6
+10V
+5V
1805
10
12
13 CD RIGHT
15 CD LEFT
2 PORE
4 SILD
6 SCL
5 DATA
INNER SWITCH
SWITCH INFO
1880
CD POS. SWITCH
1881
TRAY SWITCH
1882
CARROUSEL SWITCH
7873
14 O4
12 O6
13 O5
11 O7
DATA 15
EN1 15
STB 1
SHR_CL 3
SHIFT REGISTER
HEF4094BT
VCC 16
+10V
5V1
1 OE_LATCH
8 STR-OUTP
7 SHR_CL
9 SWITCH INFO
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR
4 O0
5 O1
6 O2
7 O3
FLEX-FOIL
1806
CONNECTOR PCB
MODULE INTERFACE

NOT ON ALL VERSIONS

For sets without this board flexfoil 8002 is connected directly.

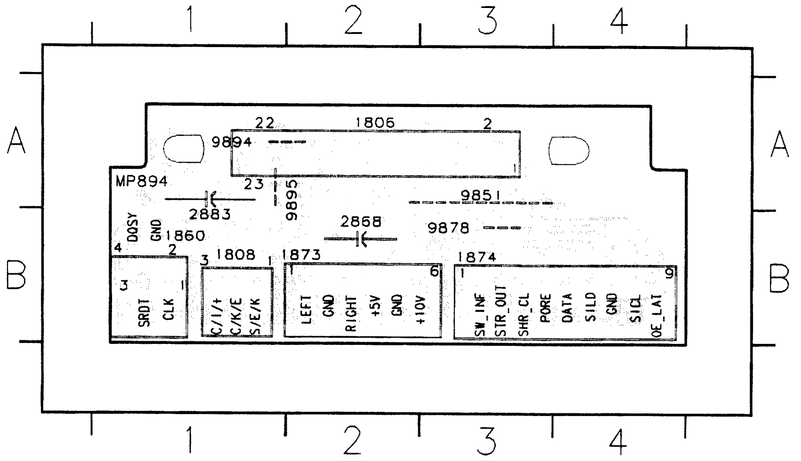
Wiring diagram


CD - MAIN BOARD
1 = OE_LATCH
2 = PORE
3 = GND
4 = SILD
5 = DATA
6 = SICL
7 = SHR_CL
8 = STR_OUT
9 = SWICH INFO
10 = +10V
11 = GND
12 = +5V
13 = CD RIGHT
14 = GNDA
15 = CD LEFT
16 = GBU/KILL
17 = COAX2/KILLR/EBU
18 = COAX1/IREF/+5
19 = GND
20 = µP_CLK
21 = DQSY
22 = SRDT
23 = GND
NOT ON ALL VERSIONS
1800
1 = TRACK-
2 = FOCUS -
3 = FOCUS +
4 = TRACK +
5 = LASER (cathode)
6 = LASER (anode)
7 = DIODE ARRAY (common cathode)
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
1
6
1801
1 = SLIDE MOTOR -
2 = SLIDE MOTOR +
3 = DISC MOTOR -
4 = DISC MOTOR +
5 = INNER SWITCH
6 = INNER SWITCH
FLEX - FOIL
NOT ON ALL VERSIONS
2
1
1806
23
CONNECTOR BOARD
9
1
1874
6
1
1873
1
3
1808
2
4
1
1860
3
1 = SWITCH INFO
2 = STR_OUT
3 = SHR_CL
4 = PORE
5 = DATA
6 = SILD
7 = GND
8 = SICL
9 = OE_LATCH
1 = CD LEFT
2 = GNDA
3 = CD RIGHT
4 = +5V
5 = GND
6 = +10V
SHIELDING/KILL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
1 = µP_CLK
2 = GND
3 = SRDT
4 = DQSY
NOT ON ALL VERSIONS
FLEX
6 WHITE
5 BLUE
SLEDGE MOTOR
CD Drive
1 BLACK
2 ORANGE
INNER SWITCH
DISC MOTO R
3 GREEN
4 YELLOW

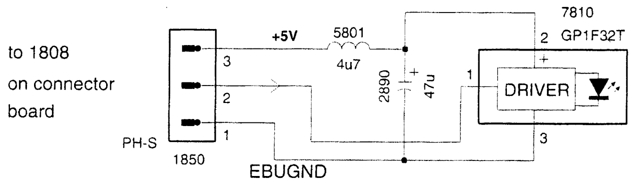
Remarks

Connector Board Copperside view

1806	A2
1808	B1
1860	B1
1873	B2
1874	B3
2868	B2
2883	B1
9851	A3
9878	B3
9894	A1
9895	A2
MP894	A1

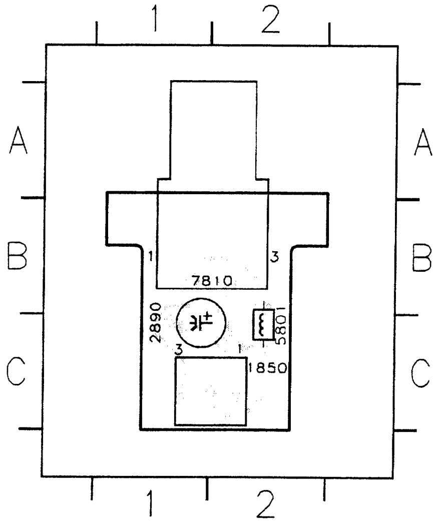

1
2
3
4
A
B
22
1806
2
9894
MP894
23
9895
2883
9851
DOSY
GND
1860
2868
9878
4
2
3
1
1808
1873
1874
6
9
SRDT
CLK
C/I/+
C/K/E
S/E/K
LEFT
GND
RIGHT
+5V
GND
+10V
SW_INF
STR_OUT
SHR_CL
PORE
DATA
SILD
GND
SICL
OE_LAT

Circuit Diagram Optical out


to 1808
on connector
board
PH-S
1850
3
2
1
+5V
5801
4u7
2890
47u
EBUGND
7810
GP1F32T
2
1
3
DRIVER

Component Layout Optical out

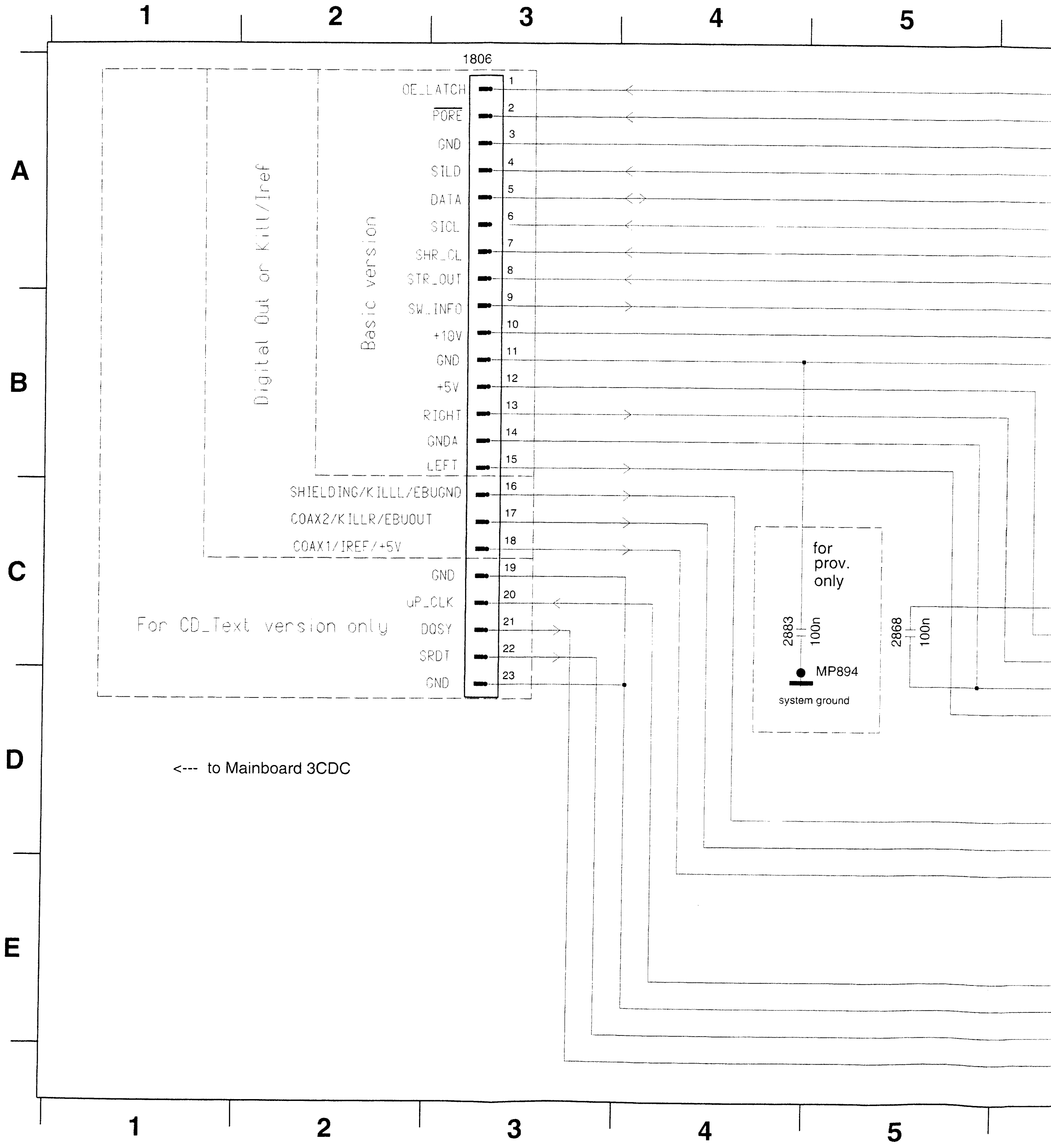
1850	C2
2890	C1
5801	C2
7810	B1


1
2
A
B
C
1
3
7810
2890
3
1
5801
1850

NOT ON ALL VERSIONS

Circuit diagram Connector Board

1806	A3
1808	D8
1860	E8
1873	D8
1874	B8
2868	C5
2883	C4


1
2
3
4
5
A
B
C
D
E
1806
OE_LATCH
PORE
GND
SILD
DATA
SICL
SHR_CL
STR_OUT
SW_INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DOSY
SRDT
GND
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Digital Out or Kill/Iref
Basic version
For CD_Text version only
<--- to Mainboard 3CDC
for
prov.
only
2883
100n
MP894
system ground
2868
100n

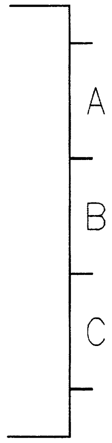
NOT ON ALL V

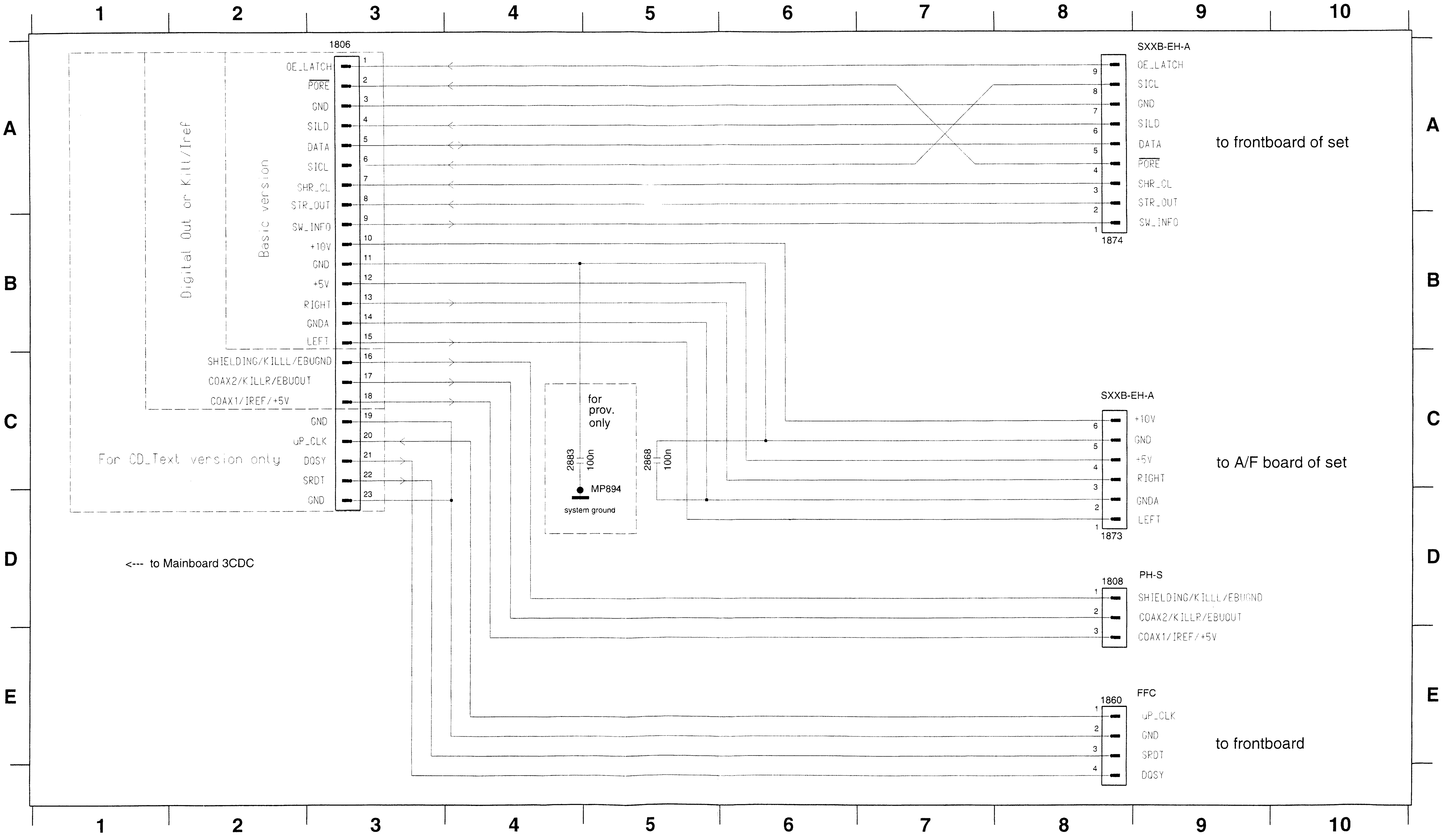
Circuit diagram Connector Board

1806	A3
1808	D8
1860	E8
1873	D8
1874	B8
2868	C5
2883	C4

out

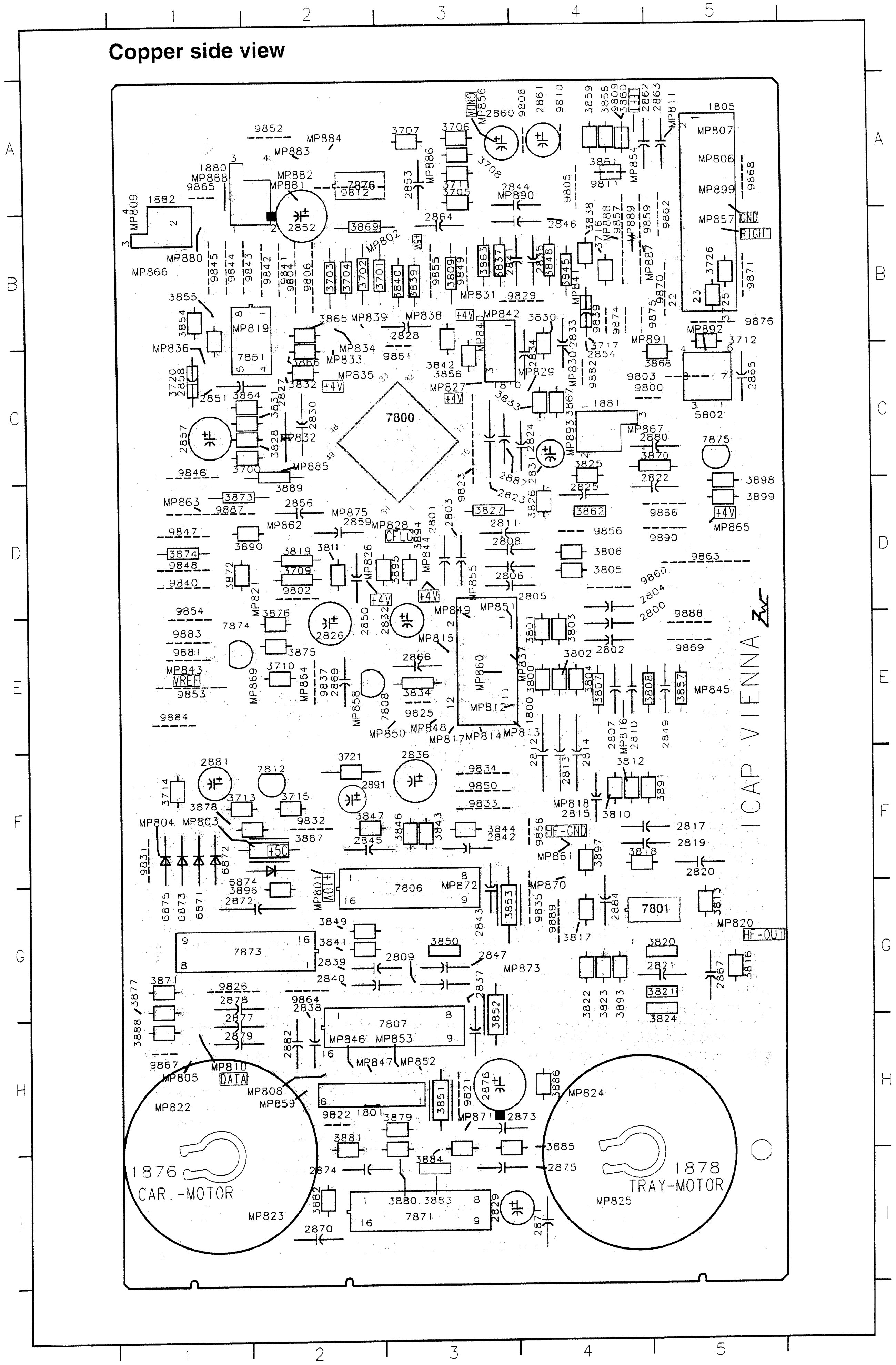
1850	C2
2890	C1
5801	C2
7810	B1




1 2 3 4 5 6 7 8 9 10
A B C D E
1806
OE_LATCH
PORE
GND
SILD
DATA
SICL
SHR_CL
STR_OUT
SW_INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DOSY
SRDT
GND
Digital Out or Kill/Iref
Basic version
For CD_Text version only
<--- to Mainboard 3CDC
for prov. only
2883
100n
2868
100n
MP894
system ground
SXXB-EH-A
1874
OE_LATCH
SICL
GND
SILD
DATA
PORE
SHR_CL
STR_OUT
SW_INFO
to frontboard of set
SXXB-EH-A
1873
+10V
GND
+5V
RIGHT
GNDA
LEFT
to A/F board of set
PH-S
1808
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
FFC
1860
uP_CLK
GND
SRDT
DOSY
to frontboard

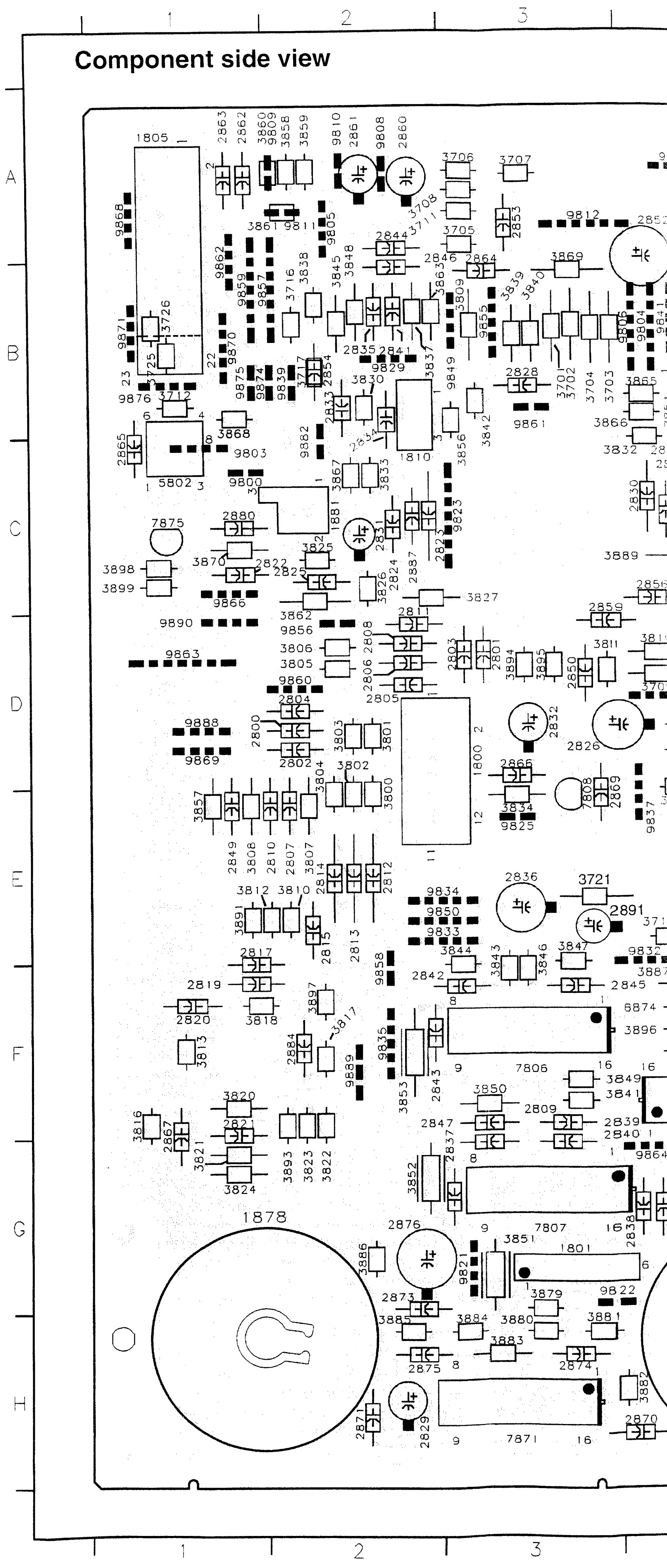
NOT ON ALL VERSIONS

Copper side view

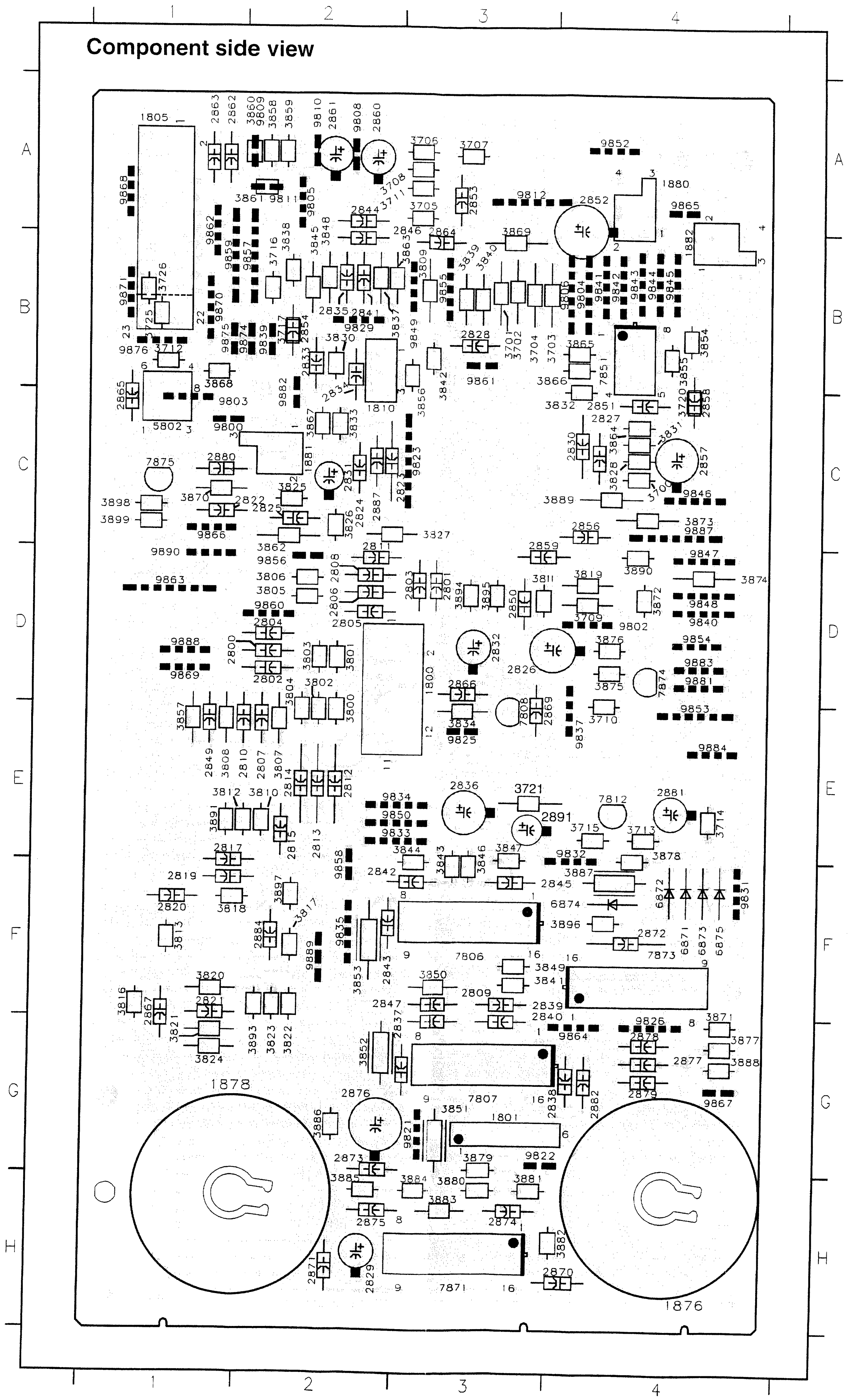

1
2
3
4
5
A
B
C
D
E
F
G
H
I
7800
ICAP VIENNA
1876
CAR.-MOTOR
1878
TRAY-MOTOR
MP822
MP823
MP824
MP825
7801
7806
7807
7871
7873
7851
MP819
1805
MP807
MP806
MP899
MP857
GND
RIGHT
HF-GND
HF-OUT
DATA
+5C
+4V
VREF
CFLG
A01

1800	E3
1801	H2
1805	B5
1810	C3
1876	I1
1878	I4
1880	B2
1881	C4
1882	B1
2800	D4
2801	D3
2802	E4
2803	D3
2804	D4
2805	D3
2806	D3
2807	E4
2808	D3
2809	G3
2810	E4
2811	D3
2812	F4
2813	F4
2814	F4
2815	F4
2817	F4
2819	F4
2820	F5
2821	G5
2822	D5
2823	C3
2824	C4
2825	D4
2826	D2
2827	C2
2828	B3
2829	I3
2830	C2
2831	C4
2832	E3
2833	B4
2834	C3
2835	B4
2836	F3
2837	H3
2838	H2
2839	G2
2840	G2
2841	B3
2842	F3
2843	G3
2844	B4
2845	F2
2846	B4
2847	G3
2849	E5
2850	D2
2851	C1
2852	A2
2853	A3
2854	B4
2856	D2
2857	C1
2858	C1
2859	D2
2860	A3
2861	A4
2862	A4
2863	A5
2864	B3
2865	C5
2866	E3
2867	G5
2869	E2
2870	I2
2871	I4
2872	G2
2873	H3
2874	I2
2875	I3
2876	H3
2877	G1
2878	G1
2879	H1
2880	C5
2881	F1
2882	H2
2884	G4
2887	C3
3700	C1
3701	B3
3702	B2
3703	B2
3704	B2
3705	A3
3706	A3
3707	A3
3708	A3
3709	D2
3710	E2
3711	A3
3712	B5
3713	F1
3714	F1
3715	F2
3716	B4
3717	B4
3720	C1
3725	B5
3726	B5
3800	E4
3801	E4
3802	E4
3803	E4
3804	E4
3805	D4
3806	D4
3807	E4
3808	E4
3809	B3
3810	F4
3811	D2
3812	F4
3813	G5
3816	G5
3817	G4
3818	F4
3819	D2
3820	G5
3821	G5
3822	G4
3823	G4
3824	G5
3825	C4
3826	D4
3827	D3
3828	C1
3830	B4
3831	C1
3832	C2
3833	C4
3834	E3
3837	B3
3838	B4
3839	B3
3840	B3
3841	G2
3842	B3
3843	F3
3844	F3
3845	B4
3846	F3
3847	F2
3848	B4
3849	G2
3850	G3
3851	H3
3852	G3
3853	G3
3854	B1
3855	B1
3856	C3
3857	E5
3858	A4
3859	A4
3860	A4
3861	A4
3862	D4
3863	B3
3864	C1
3865	B2
3866	C2
3867	C4
3868	B5
3869	B2
3870	C5
3871	G1
3872	D1
3873	D1
3874	D1
3875	E2
3876	E2
3877	G1
3878	F2
3879	H3
3880	H3
3881	H2
3882	I2
3883	I3
3884	H3
3885	H3
3886	H4
3887	F2
3888	H1
3889	C2
3890	D1
3891	F4
3893	G4
3894	D3
3895	D3
3896	G2
3897	F4
3898	D5
3899	D5
5802	C5
6871	F1
6872	F1
6873	F1
6874	F2
6875	F1
7800	C2
7801	G4
7806	G3
7807	H3
7808	E2
7812	F2
7851	B2
7871	I3
7873	G1
7874	E1
7875	C5
9800	C4
9802	D2
9803	C5
9804	B2
9805	A4
9806	B2
9808	A4
9809	A4
9810	A4
9811	A4
9812	A2
9821	H3
9822	H2
9823	C3
9825	E3
9826	G1
9829	B4
9831	F1
9832	F2
9833	F3
9834	F3
9835	G4
9837	E2
9839	B4
9840	D1
9841	B2
9842	B2
9843	B2
9844	B1
9845	B1
9846	C1
9847	D1
9848	D1
9849	B3
9850	F3
9852	A2
9853	E1
9854	D1
9855	B3
9856	D4
9857	B4
9858	F4
9859	B4
9860	D4
9861	B3
9862	B5
9863	D5
9864	G2
9865	A1
9866	D5
9867	H1
9868	A5
9869	E5
9870	B5
9871	B5
9874	B4
9875	B4
9876	B5
9881	E1
9882	C4
9883	E1
9884	E1
9887	D1
9888	E5
9889	G4
9890	D5

Component side view

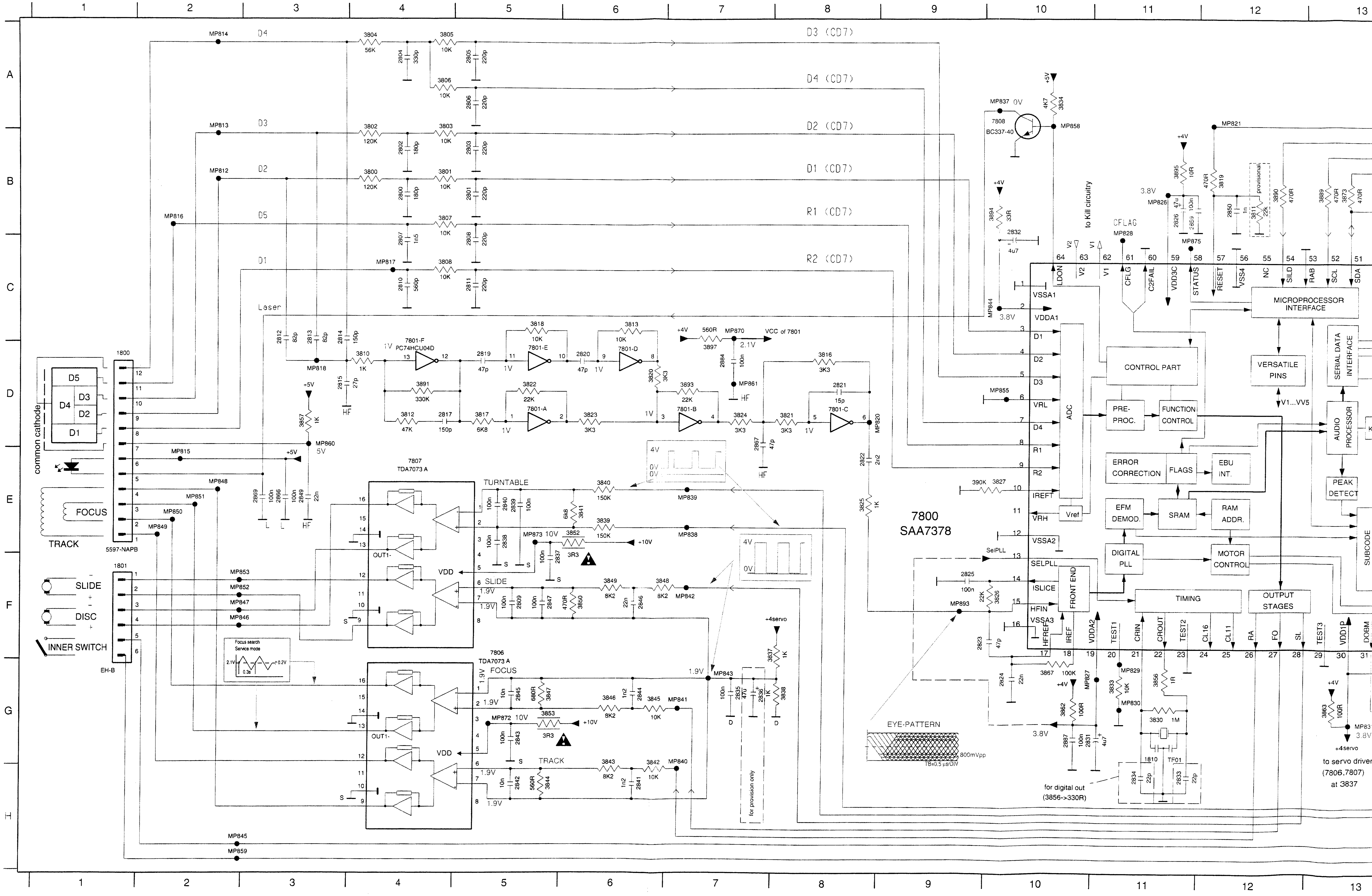

1
2
3
A
B
C
D
E
F
G
H
1805
1810
5802
7875
7806
7807
7871
1878
1801

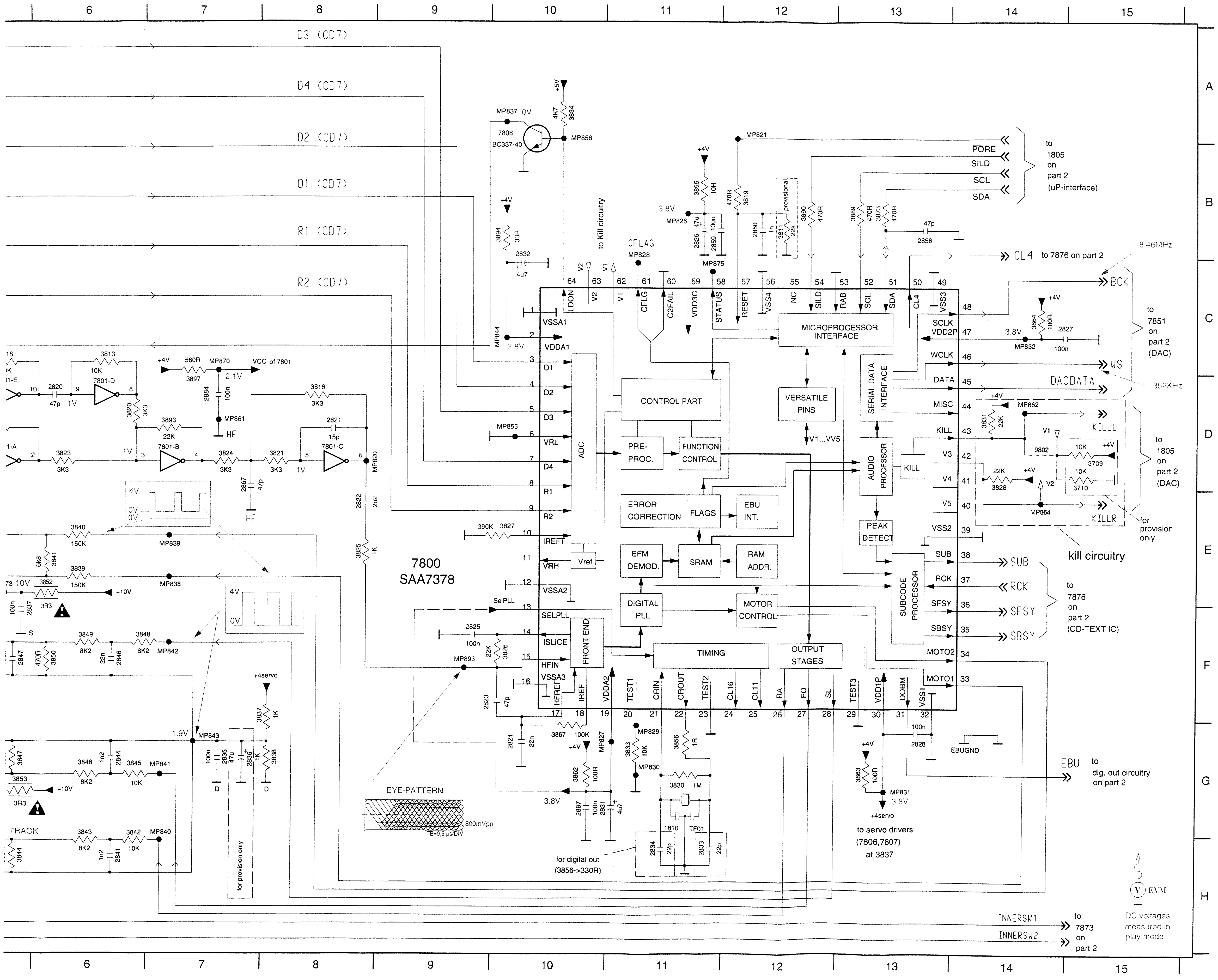
1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3868	B5	9841	B2
2821	G5	3712	B5	3869	B2	9842	B2
2822	D5	3713	F1	3870	C5	9843	B2
2823	C3	3714	F1	3871	G1	9844	B1
2824	C4	3715	F2	3872	D1	9845	B1
2825	D4	3716	B4	3873	D1	9846	C1
2826	D2	3717	B4	3874	D1	9847	D1
2827	C2	3720	C1	3875	E2	9848	D1
2828	B3	3725	B5	3876	E2	9849	B3
2829	I3	3726	B5	3877	G1	9850	F3
2830	C2	3800	E4	3878	F2	9852	A2
2831	C4	3801	E4	3879	H3	9853	E1
2832	E3	3802	E4	3880	H3	9854	D1
2833	B4	3803	E4	3881	H2	9855	B3
2834	C3	3804	E4	3882	I2	9856	D4
2835	B4	3805	D4	3883	I3	9857	B4
2836	F3	3806	D4	3884	H3	9858	F4
2837	H3	3807	E4	3885	H3	9859	B4
2838	H2	3808	E4	3886	H4	9860	D4
2839	G2	3809	B3	3887	F2	9861	B3
2840	G2	3810	F4	3888	H1	9862	B5
2841	B3	3811	D2	3889	C2	9863	D5
2842	F3	3812	F4	3890	D1	9864	G2
2843	G3	3813	G5	3891	F4	9865	A1
2844	B4	3816	G5	3893	G4	9866	D5
2845	F2	3817	G4	3894	D3	9867	H1
2846	B4	3818	F4	3895	D3	9868	A5
2847	G3	3819	D2	3896	G2	9869	E5
2849	E5	3820	G5	3897	F4	9870	B5
2850	D2	3821	G5	3898	D5	9871	B5
2851	C1	3822	G4	3899	D5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		


Component side view

1800	D3	2869	E3	3841	F3	9800	C1
1801	G3	2870	H4	3842	B3	9802	D4
1805	A1	2871	H2	3843	F3	9803	C1
1810	B2	2872	F4	3844	F3	9804	B4
1876	H4	2873	G2	3845	B2	9805	A2
1878	H1	2874	H3	3846	F3	9806	B4
1880	B4	2875	H2	3847	E3	9808	A2
1881	C2	2876	G3	3848	B2	9809	A2
1882	B4	2877	G4	3849	F3	9810	A2
2800	D2	2878	G4	3850	F3	9811	A2
2801	D3	2879	G4	3851	G3	9812	A3
2802	D2	2880	C1	3852	G2	9821	G3
2803	D3	2881	E4	3853	F2	9822	G3
2804	D2	2882	G4	3854	B4	9823	C3
2805	D2	2884	F2	3855	B4	9825	E3
2806	D2	2887	C2	3856	B3	9826	G4
2807	E2	3700	C4	3857	E1	9829	B2
2808	D2	3701	B3	3858	A2	9831	F4
2809	F3	3702	B3	3859	A2	9832	E4
2810	E2	3703	B3	3860	A2	9833	E2
2811	D2	3704	B3	3861	A2	9834	E2
2812	E2	3705	A3	3862	C2	9835	F2
2813	E2	3706	A3	3863	B2	9837	E4
2814	E2	3707	A3	3864	C4	9839	B2
2815	E2	3708	A3	3865	B4	9840	D4
2817	F1	3709	D4	3866	B4	9841	B4
2819	F1	3710	E4	3867	C2	9842	B4
2820	F1	3711	A3	3868	B1	9843	B4
2821	G1	3712	B1	3869	B3	9844	B4
2822	C1	3713	E4	3870	C1	9845	B4
2823	C2	3714	E4	3871	G4	9846	C4
2824	C2	3715	E4	3872	D4	9847	D4
2825	C2	3716	B2	3873	C4	9848	D4
2826	D3	3717	B2	3874	D4	9849	B3
2827	C4	3720	C4	3875	D4	9850	E2
2828	B3	3725	B1	3876	D4	9852	A4
2829	H2	3726	B1	3877	G4	9853	E4
2830	C4	3800	E2	3878	E4	9854	D4
2831	C2	3801	D2	3879	G3	9855	B3
2832	D3	3802	E2	3880	H3	9856	D2
2833	B2	3803	D2	3881	H3	9857	B2
2834	B2	3804	E2	3882	H4	9858	F2
2835	B2	3805	D2	3883	H3	9859	B1
2836	E3	3806	D2	3884	H3	9860	D2
2837	G2	3807	E2	3885	H2	9861	B3
2838	G4	3808	E1	3886	G2	9862	A1
2839	F3	3809	B3	3887	F4	9863	D1
2840	F3	3810	E2	3888	G4	9864	G4
2841	B2	3811	D3	3889	C4	9865	A4
2842	F3	3812	E2	3890	D4	9866	C1
2843	F2	3813	F1	3891	E1	9867	G4
2844	B2	3816	F1	3893	F2	9868	A1
2845	F3	3817	F2	3894	D3	9869	D1
2846	B2	3818	F1	3895	D3	9870	B1
2847	F3	3819	D4	3896	F4	9871	B1
2849	E1	3820	F1	3897	F2	9874	B2
2850	D3	3821	G1	3898	C1	9875	B1
2851	C4	3822	F2	3899	C1	9876	B1
2852	A4	3823	F2	5802	C1	9881	D4
2853	A3	3824	G1	6871	F4	9882	C2
2854	B2	3825	C2	6872	F4	9883	D4
2856	C4	3826	C2	6873	F4	9884	E4
2857	C4	3827	C2	6874	F4	9887	C4
2858	C4	3828	C4	6875	F4	9888	D1
2859	C3	3830	B2	7806	F3	9889	F2
2860	A2	3831	C4	7807	G3	9890	D1
2861	A2	3832	C4	7808	E3		
2862	A1	3833	C2	7812	E4		
2863	A1	3834	E3	7851	B4		
2864	B3	3837	B2	7871	H3		
2865	C1	3838	B2	7873	F4		
2866	E3	3839	B3	7874	D4		
2867	F1	3840	B3	7875	C1		

Circuit Diagram Main Board part1


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
MP814
D4
3804
56K
3805
10K
2804
330p
2805
220p
3806
10K
2806
220p
D3 (CD7)
D4 (CD7)
D2 (CD7)
D1 (CD7)
R1 (CD7)
R2 (CD7)
MP813
D3
3802
120K
3803
10K
2802
180p
2803
220p
MP812
D2
3800
120K
3801
10K
2800
180p
2801
220p
MP816
D5
3807
10K
2807
1n5
2808
220p
D1
MP817
3808
10K
2810
560p
2811
220p
Laser
2812
82p
2813
82p
2814
150p
MP818
3810
1K
2815
27p
HF
1V
7801-F
PC74HCU04D
13
12
2819
47p
3818
10K
7801-E
11
10
2820
47p
3813
10K
7801-D
9
8
3820
3K3
3891
330K
3822
22K
3812
47K
2817
150p
3817
6K8
7801-A
3823
3K3
7801-B
3893
22K
3824
3K3
3821
3K3
7801-C
3816
3K3
2821
15p
MP820
+4V
560R
3897
MP870
VCC of 7801
2.1V
2884
100n
MP861
HF
2867
47p
2822
2n2
3825
1K
+5V
3857
1K
MP860
5V
MP815
1800
12
11
10
9
8
7
6
5
4
3
2
1
5597-NAPB
D5
D3
D4
D2
D1
common cathode
FOCUS
TRACK
MP848
MP851
MP850
MP849
2869
100n
2866
100n
2849
22n
7807
TDA7073 A
TURNTABLE
3840
150K
MP839
3841
6K8
2840
100n
2839
100n
3839
150K
MP838
2838
MP873
10V
3852
3R3
+10V
2837
100n
S
OUT1-
VDD
16
15
14
13
12
11
10
9
SLIDE
1.9V
2809
100n
2847
100n
3850
470R
3849
8K2
2846
22n
3848
8K2
MP842
4V
0V
1801
MP853
MP852
MP847
MP846
SLIDE
DISC
INNER SWITCH
EH-B
Focus search
Service mode
2.1V
+0.2V
0.3s
7806
TDA7073 A
FOCUS
2845
10n
3847
680R
3846
8K2
2844
1n2
3845
10K
MP841
MP872
10V
3853
3R3
2843
100n
TRACK
3843
8K2
3842
10K
2841
1n2
MP840
2842
10n
3844
560R
MP843
+4servo
3837
1K
2835
100n
2836
470u
3838
1K
for provision only
MP845
MP859
EYE-PATTERN
800mVpp
TB=0.5 µs/DIV
7800
SAA7378
+5V
4K7
3834
MP837 0V
7808
BC337-40
MP858
+4V
3894
33R
2832
4u7
to Kill circuitry
MP844
3.8V
MP855
390K
3827
SelPLL
2825
100n
3826
22K
MP893
2823
47p
2824
22n
3867
100K
+4V
3862
100R
MP827
2887
100n
2831
4u7
3.8V
MP829
3833
10K
MP830
3856
1R
3830
1M
1810
TF01
2834
22p
2833
22p
for digital out
(3856->330R)
CFLAG
MP828
3.8V
MP826
+4V
3895
10R
2826
47u
2859
100n
MP875
MP821
3819
470R
2850
1n
provisional
3811
22k
3890
470R
3889
470R
3873
470R
64
63
62
61
60
59
58
57
56
55
54
53
52
51
LDON
V2
V1
CFLG
C2FAIL
VDD3C
STATUS
RESET
VSS4
NC
SILD
RAB
SCL
SDA
VSSA1
VDDA1
D1
D2
D3
VRL
D4
R1
R2
IREFT
VRH
VSSA2
SELPLL
ISLICE
HFIN
VSSA3
HFREF
IREF
VDDA2
TEST1
CRIN
CROUT
TEST2
CL16
CL11
RA
FO
SL
TEST3
VDD1P
DOBM
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
ADC
Vref
FRONT END
CONTROL PART
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
TIMING
OUTPUT STAGES
MICROPROCESSOR INTERFACE
VERSATILE PINS
V1...V5
SERIAL DATA INTERFACE
AUDIO PROCESSOR
PEAK DETECT
SUBCODE
+4V
3863
100R
MP83
3.8V
+4servo
to servo driver
(7806,7807)
at 3837


D3 (CD7)
D4 (CD7)
D2 (CD7)
D1 (CD7)
R1 (CD7)
R2 (CD7)
7800
SAA7378
ADC
CONTROL PART
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
MICROPROCESSOR INTERFACE
VERSATILE PINS
SERIAL DATA INTERFACE
AUDIO PROCESSOR
KILL
PEAK DETECT
SUBCODE PROCESSOR
Vref
VSSA1
VDDA1
VRL
IREFT
VRH
VSSA2
SELPLL
ISLICE
HFIN
VSSA3
HFREF
IREF
VDDA2
TEST1
CRIN
CROUT
TEST2
CL16
CL11
RA
FO
SL
TEST3
VDD1P
DOBM
VSS1
LDON
CFLG
C2FAIL
VDD3C
STATUS
RESET
VSS4
NC
SILD
RAB
SCL
SDA
CL4
VSS3
SCLK
VDD2P
WCLK
DATA
MISC
V3
V4
V5
VSS2
SUB
RCK
SFSY
SBSY
MOTO2
MOTO1
PORE
to 1805 on part 2 (uP-interface)
CL4 to 7876 on part 2
8.46MHz
BCK
WS
DACDATA
352KHz
to 7851 on part 2 (DAC)
KILLL
KILLR
to 1805 on part 2 (DAC)
for provision only
kill circuitry
to 7876 on part 2 (CD-TEXT IC)
EBU to dig. out circuitry on part 2
to servo drivers (7806,7807) at 3837
INNERSW1
INNERSW2
to 7873 on part 2
DC voltages measured in play mode
EVM
EYE-PATTERN
800mVpp
TB=0.5 µs/DIV
for digital out (3856->330R)
for provision only
to Kill circuitry
provisional
7808 BC337-40
VCC of 7801
7801-A
7801-B
7801-C
7801-D
TRACK
1810
TF01
+5V
+4V
+4servo
+10V
3.8V
SelPLL
A
B
C
D
E
F
G
H
6
7
8
9
10
11
12
13
14
15

1800	D1
1801	F1
1810	G11
2800	B4
2801	B5
2802	B4
2803	B5
2804	A4
2805	A5
2806	A5
2807	C4
2808	C5
2809	F5
2810	C4
2811	C5
2812	C3
2813	C3
2814	C3
2815	D3
2817	D4
2819	D5
2820	D6
2821	D8
2822	E8
2823	F9
2824	G9
2825	F9
2826	B11
2827	C14
2828	G13
2831	G10
2832	B10
2833	H11
2834	H11
2835	G7
2836	G7
2837	F5
2838	E5
2839	E5
2840	E5
2841	H6
2842	H5
2843	G5
2844	G6
2845	G5
2846	F6
2847	F5
2849	E3
2850	B12
2856	B13
2859	B11
2866	E3
2867	D7
2869	E3
2884	D7
2887	G10
3709	D15
3710	D15
3800	B4
3801	B4
3802	A4
3803	A4
3804	A4
3805	A4
3806	A4
3807	B4
3808	C4
3810	D4
3811	B12
3812	D4
3813	C6
3816	D8
3817	D5
3818	C5
3819	B12
3820	D6
3821	D8
3822	D5
3823	D6
3824	D7
3825	E8
3826	F10
3827	E10
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3838	G8
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3842	G6
3843	G6
3844	H5
3845	G6
3846	G6
3847	G5
3848	F6
3849	F6
3850	F6
3852	E6
3853	G5
3856	G11
3857	D3
3862	G10
3863	G13
3864	C14
3867	G10
3873	B13
3889	B13
3890	B12
3891	D4
3893	D7
3894	B10
3895	B11
3897	D7
7800	E9
7801-A	D5
7801-B	D7
7801-C	D8
7801-D	D6
7801-E	D5
7801-F	D4
7806	G5
7807	E4
7808	B10
9802	D14
MP812	B2
MP813	A2
MP814	A2
MP815	E2
MP816	B2
MP817	C4
MP818	D3
MP820	D8
MP821	B12
MP826	B11
MP827	G10
MP828	B11
MP829	G11
MP830	G11
MP831	G13
MP832	C14
MP837	B10
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MP844	C10
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MP849	E2
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MP852	F2
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MP858	B10
MP859	H3
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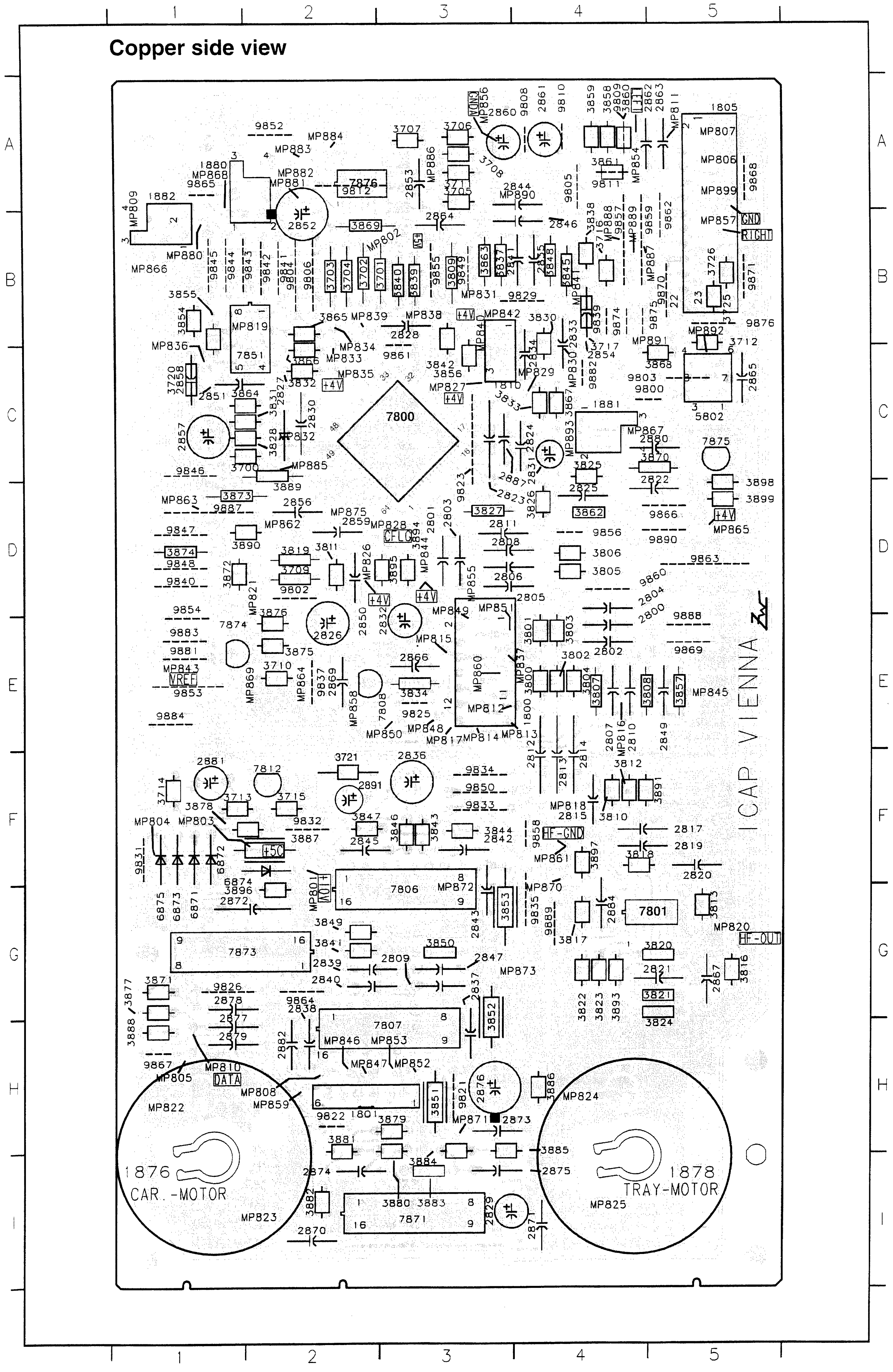
Copper side view
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7800
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7876
1805
1810
1881
1876
CAR.-MOTOR
1878
TRAY-MOTOR
ICAP VIENNA
GND
RIGHT
HF-OUT
HF-GND
DATA
VREF
CFLG
+4V
+5V

1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3868	B5	9841	B2
2821	G5	3712	B5	3869	B2	9842	B2
2822	D5	3713	F1	3870	C5	9843	B2
2823	C3	3714	F1	3871	G1	9844	B1
2824	C4	3715	F2	3872	D1	9845	B1
2825	D4	3716	B4	3873	D1	9846	C1
2826	D2	3717	B4	3874	D1	9847	D1
2827	C2	3720	C1	3875	E2	9848	D1
2828	B3	3725	B5	3876	E2	9849	B3
2829	I3	3726	B5	3877	G1	9850	F3
2830	C2	3800	E4	3878	F2	9852	A2
2831	C4	3801	E4	3879	H3	9853	E1
2832	E3	3802	E4	3880	H3	9854	D1
2833	B4	3803	E4	3881	H2	9855	B3
2834	C3	3804	E4	3882	I2	9856	D4
2835	B4	3805	D4	3883	I3	9857	B4
2836	F3	3806	D4	3884	H3	9858	F4
2837	H3	3807	E4	3885	H3	9859	B4
2838	H2	3808	E4	3886	H4	9860	D4
2839	G2	3809	B3	3887	F2	9861	B3
2840	G2	3810	F4	3888	H1	9862	B5
2841	B3	3811	D2	3889	C2	9863	D5
2842	F3	3812	F4	3890	D1	9864	G2
2843	G3	3813	G5	3891	F4	9865	A1
2844	B4	3816	G5	3893	G4	9866	D5
2845	F2	3817	G4	3894	D3	9867	H1
2846	B4	3818	F4	3895	D3	9868	A5
2847	G3	3819	D2	3896	G2	9869	E5
2849	E5	3820	G5	3897	F4	9870	B5
2850	D2	3821	G5	3898	D5	9871	B5
2851	C1	3822	G4	3899	D5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
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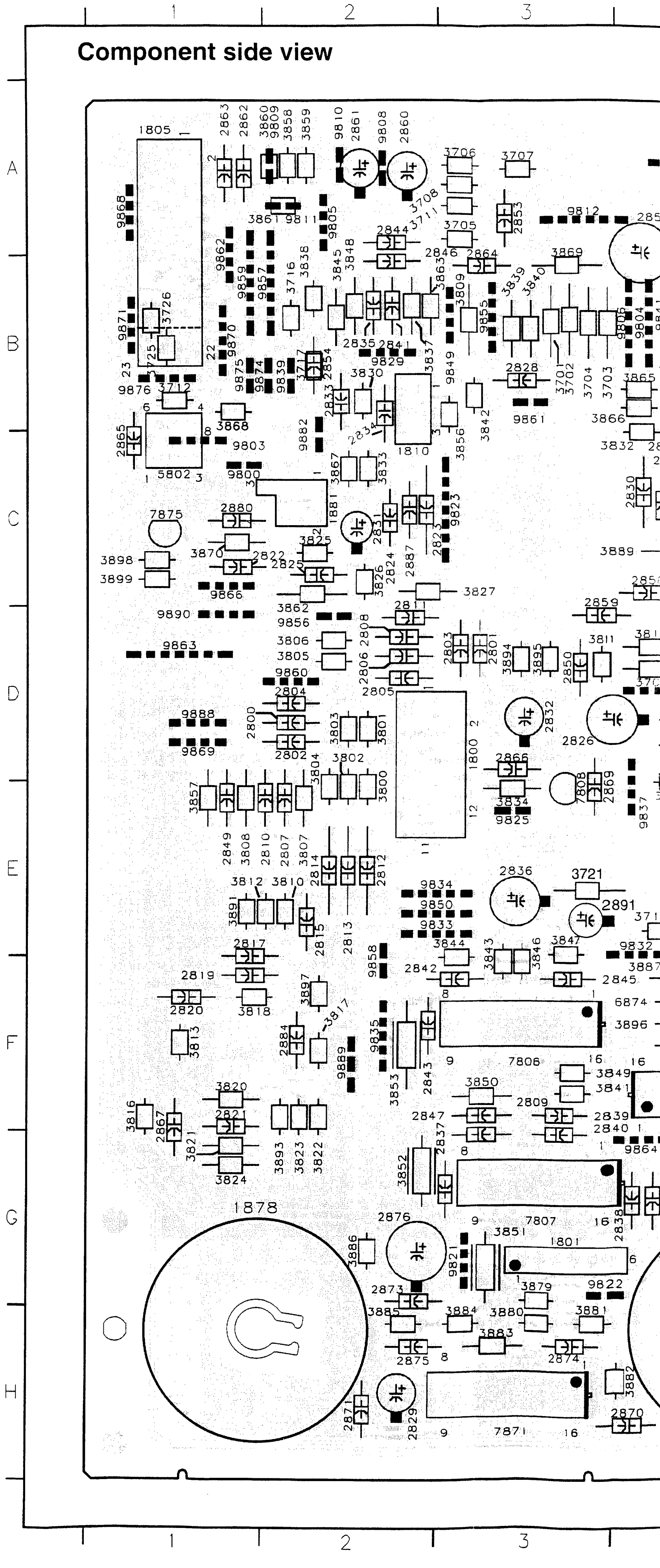
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		


Component side view
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A
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C
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G
H
1805
1810
1800
1801
1878
7806
7807
7871
5802

1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3868	B5	9841	B2
2821	G5	3712	B5	3869	B2	9842	B2
2822	D5	3713	F1	3870	C5	9843	B2
2823	C3	3714	F1	3871	G1	9844	B1
2824	C4	3715	F2	3872	D1	9845	B1
2825	D4	3716	B4	3873	D1	9846	C1
2826	D2	3717	B4	3874	D1	9847	D1
2827	C2	3720	C1	3875	E2	9848	D1
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2829	I3	3726	B5	3877	G1	9850	F3
2830	C2	3800	E4	3878	F2	9852	A2
2831	C4	3801	E4	3879	H3	9853	E1
2832	E3	3802	E4	3880	H3	9854	D1
2833	B4	3803	E4	3881	H2	9855	B3
2834	C3	3804	E4	3882	I2	9856	D4
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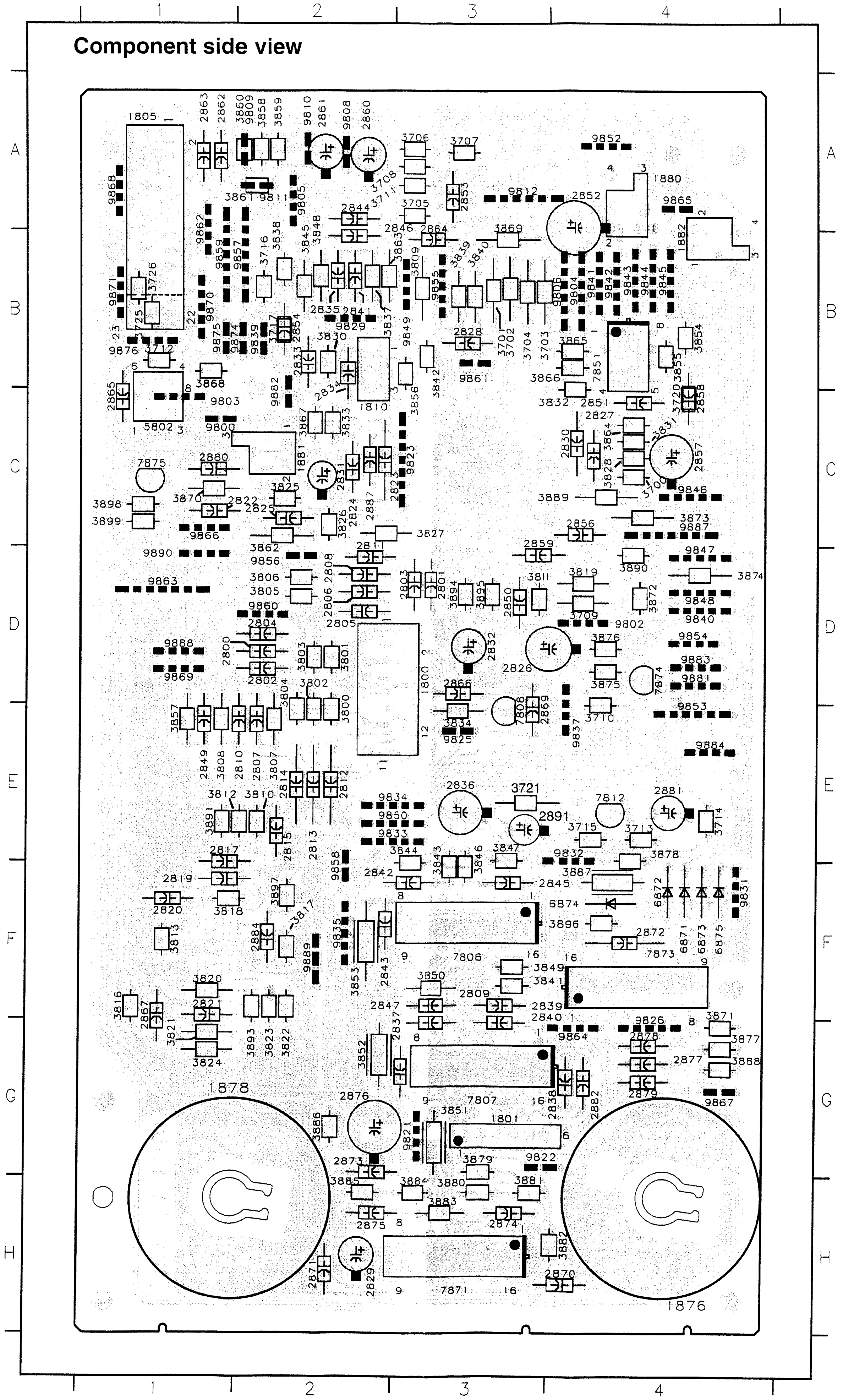
2836	F3	3806	D4	3884	H3	9858	F4
2837	H3	3807	E4	3885	H3	9859	B4
2838	H2	3808	E4	3886	H4	9860	D4
2839	G2	3809	B3	3887	F2	9861	B3
2840	G2	3810	F4	3888	H1	9862	B5
2841	B3	3811	D2	3889	C2	9863	D5
2842	F3	3812	F4	3890	D1	9864	G2
2843	G3	3813	G5	3891	F4	9865	A1
2844	B4	3816	G5	3893	G4	9866	D5
2845	F2	3817	G4	3894	D3	9867	H1
2846	B4	3818	F4	3895	D3	9868	A5
2847	G3	3819	D2	3896	G2	9869	E5
2849	E5	3820	G5	3897	F4	9870	B5
2850	D2	3821	G5	3898	D5	9871	B5
2851	C1	3822	G4	3899	D5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		

Component side view



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1810	B2	2872	F4	3844	F3	9804	B4
1876	H4	2873	G2	3845	B2	9805	A2
1878	H1	2874	H3	3846	F3	9806	B4
1880	B4	2875	H2	3847	E3	9808	A2
1881	C2	2876	G3	3848	B2	9809	A2
1882	B4	2877	G4	3849	F3	9810	A2
2800	D2	2878	G4	3850	F3	9811	A2
2801	D3	2879	G4	3851	G3	9812	A3
2802	D2	2880	C1	3852	G2	9821	G3
2803	D3	2881	E4	3853	F2	9822	G3
2804	D2	2882	G4	3854	B4	9823	C3
2805	D2	2884	F2	3855	B4	9825	E3
2806	D2	2887	C2	3856	B3	9826	G4
2807	E2	3700	C4	3857	E1	9829	B2
2808	D2	3701	B3	3858	A2	9831	F4
2809	F3	3702	B3	3859	A2	9832	E4
2810	E2	3703	B3	3860	A2	9833	E2
2811	D2	3704	B3	3861	A2	9834	E2
2812	E2	3705	A3	3862	C2	9835	F2
2813	E2	3706	A3	3863	B2	9837	E4
2814	E2	3707	A3	3864	C4	9839	B2
2815	E2	3708	A3	3865	B4	9840	D4
2817	F1	3709	D4	3866	B4	9841	B4
2819	F1	3710	E4	3867	C2	9842	B4
2820	F1	3711	A3	3868	B1	9843	B4
2821	G1	3712	B1	3869	B3	9844	B4
2822	C1	3713	E4	3870	C1	9845	B4
2823	C2	3714	E4	3871	G4	9846	C4
2824	C2	3715	E4	3872	D4	9847	D4
2825	C2	3716	B2	3873	C4	9848	D4
2826	D3	3717	B2	3874	D4	9849	B3
2827	C4	3720	C4	3875	D4	9850	E2
2828	B3	3725	B1	3876	D4	9852	A4
2829	H2	3726	B1	3877	G4	9853	E4
2830	C4	3800	E2	3878	E4	9854	D4
2831	C2	3801	D2	3879	G3	9855	B3
2832	D3	3802	E2	3880	H3	9856	D2
2833	B2	3803	D2	3881	H3	9857	B2
2834	B2	3804	E2	3882	H4	9858	F2
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2837	G2	3807	E2	3885	H2	9861	B3
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2839	F3	3809	B3	3887	F4	9863	D1
2840	F3	3810	E2	3888	G4	9864	G4
2841	B2	3811	D3	3889	C4	9865	A4
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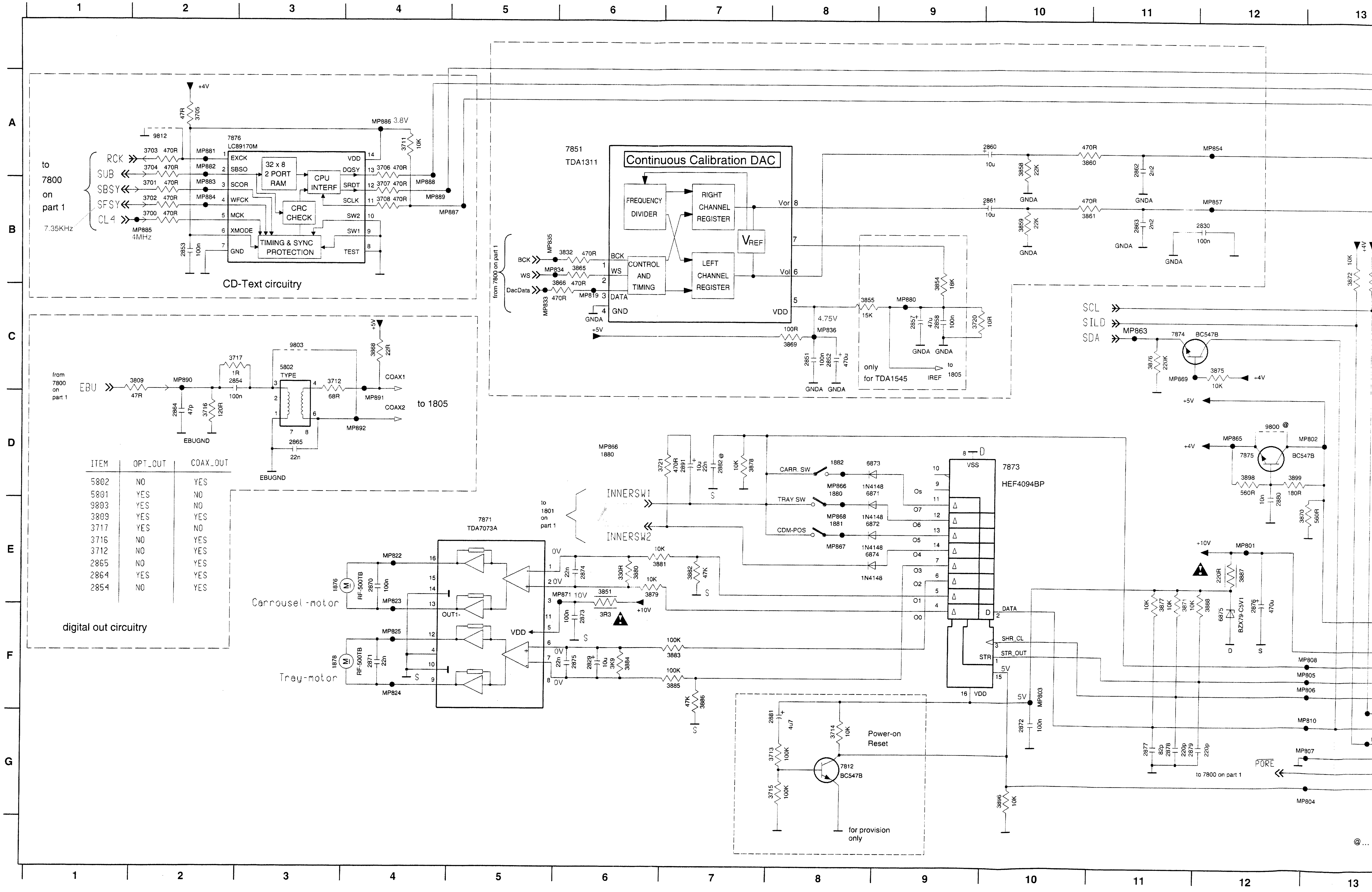
2843	F2	3813	F1	3891	E1	9867	G4
2844	B2	3816	F1	3893	F2	9868	A1
2845	F3	3817	F2	3894	D3	9869	D1
2846	B2	3818	F1	3895	D3	9870	B1
2847	F3	3819	D4	3896	F4	9871	B1
2849	E1	3820	F1	3897	F2	9874	B2
2850	D3	3821	G1	3898	C1	9875	B1
2851	C4	3822	F2	3899	C1	9876	B1
2852	A4	3823	F2	5802	C1	9881	D4
2853	A3	3824	G1	6871	F4	9882	C2
2854	B2	3825	C2	6872	F4	9883	D4
2856	C4	3826	C2	6873	F4	9884	E4
2857	C4	3827	C2	6874	F4	9887	C4
2858	C4	3828	C4	6875	F4	9888	D1
2859	C3	3830	B2	7806	F3	9889	F2
2860	A2	3831	C4	7807	G3	9890	D1
2861	A2	3832	C4	7808	E3		
2862	A1	3833	C2	7812	E4		
2863	A1	3834	E3	7851	B4		
2864	B3	3837	B2	7871	H3		
2865	C1	3838	B2	7873	F4		
2866	E3	3839	B3	7874	D4		
2867	F1	3840	B3	7875	C1		

Circuit Diagram Main Board part2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A
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G
CD-Text circuitry
7876
LC89170M
EXCK
SBSO
SCOR
WFCK
MCK
XMODE
GND
VDD
DQSY
SRDT
SCLK
SW2
SW1
TEST
32 x 8
2 PORT
RAM
CPU
INTERF
CRC
CHECK
TIMING & SYNC
PROTECTION
+4V
3705
47R
9812
MP886 3.8V
3711
10K
to
7800
on
part 1
RCK
SUB
SBSY
SFSY
CL4
7.35KHz
MP885
4MHz
3703 470R
3704 470R
3701 470R
3702 470R
3700 470R
MP881
MP882
MP883
MP884
3706 470R
3707 470R
3708 470R
MP888
MP889
MP887
2853
100n
7851
TDA1311
Continuous Calibration DAC
FREQUENCY
DIVIDER
RIGHT
CHANNEL
REGISTER
LEFT
CHANNEL
REGISTER
CONTROL
AND
TIMING
VREF
BCK
WS
DATA
GND
VDD
Vor
Vol
from 7800 on part 1
BCK
WS
DacData
MP835
MP834
MP833
3832 470R
3865
3866 470R
470R
MP819
GNDA
+5V
100R
3869
4.75V
MP836
2851
100n
2852
470u
GNDA
3855
15K
MP880
3854
18K
2857
47u
2858
100n
3720
10R
only
for TDA1545
IREF
to
1805
2860
10u
3858
22K
470R
3860
2862
2n2
MP854
2861
10u
3859
22K
470R
3861
2863
2n2
MP857
2830
100n
3872
10K
+4V
SCL
SILD
SDA
MP863
7874 BC547B
3876
220K
MP869
3875
10K
+4V
+5V
digital out circuitry
from
7800
on
part 1
EBU
3809
47R
MP890
2864
47p
3716
120R
EBUGND
3717
1R
2854
100n
9803
5802
TYPE
3712
68R
3868
22R
COAX1
MP891
COAX2
MP892
to 1805
2865
22n
EBUGND
7871
TDA7073A
MP822
MP823
MP825
MP824
1876
M
RF-500TB
2870
100n
1878
M
RF-500TB
2871
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Carrousel-motor
Tray-motor
OUT1-
VDD
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2 0V
MP871 10V
3851
3R3
+10V
2874
22n
2873
100n
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330R
3881
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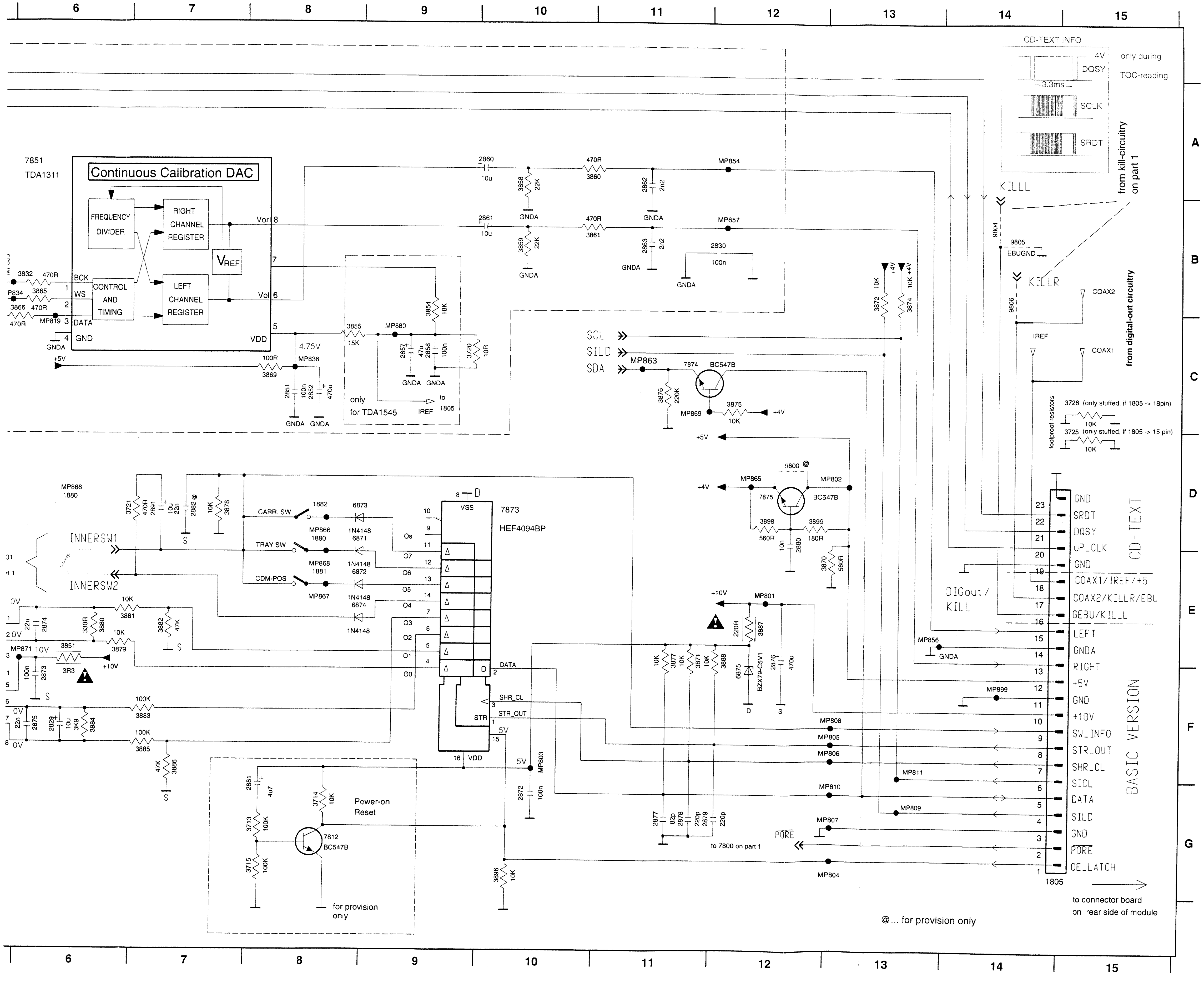
3879
10K
3882
47K
0V
2875
22n
2829
10u
3K9
3884
100K
3883
100K
3885
3886
47K
MP866
1880
3721
470R
2891
10u
2882 @
22n
3878
10K
to
1801
on
part 1
INNERSW1
INNERSW2
CARR. SW
TRAY SW
CDM-POS
1882
MP866
1880
MP868
1881
MP867
6873
1N4148
6871
1N4148
6872
1N4148
6874
1N4148
7873
HEF4094BP
VSS
VDD
DATA
STR
SHR_CL
STR_OUT
5V
MP803
2872
100n
Power-on
Reset
2881
4u7
3714
10K
3713
100K
3715
100K
7812
BC547B
for provision
only
3896
10K
9800 @
MP865
MP802
+4V
7875
BC547B
3898
560R
3899
180R
10n
2880
3870
560R
+10V
MP801
3887
220R
6875
BZX79 C5V1
2876
470u
3877 10K
3871 10K
3888 10K
2877 82p
2878 220p
2879 220p
MP808
MP805
MP806
MP810
MP807
PORE
to 7800 on part 1
MP804
@...

ITEM	OPT_OUT	COAX_OUT
5802	NO	YES
5801	YES	NO
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	NO	YES
2865	NO	YES
2864	YES	YES
2854	NO	YES


6
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8
9
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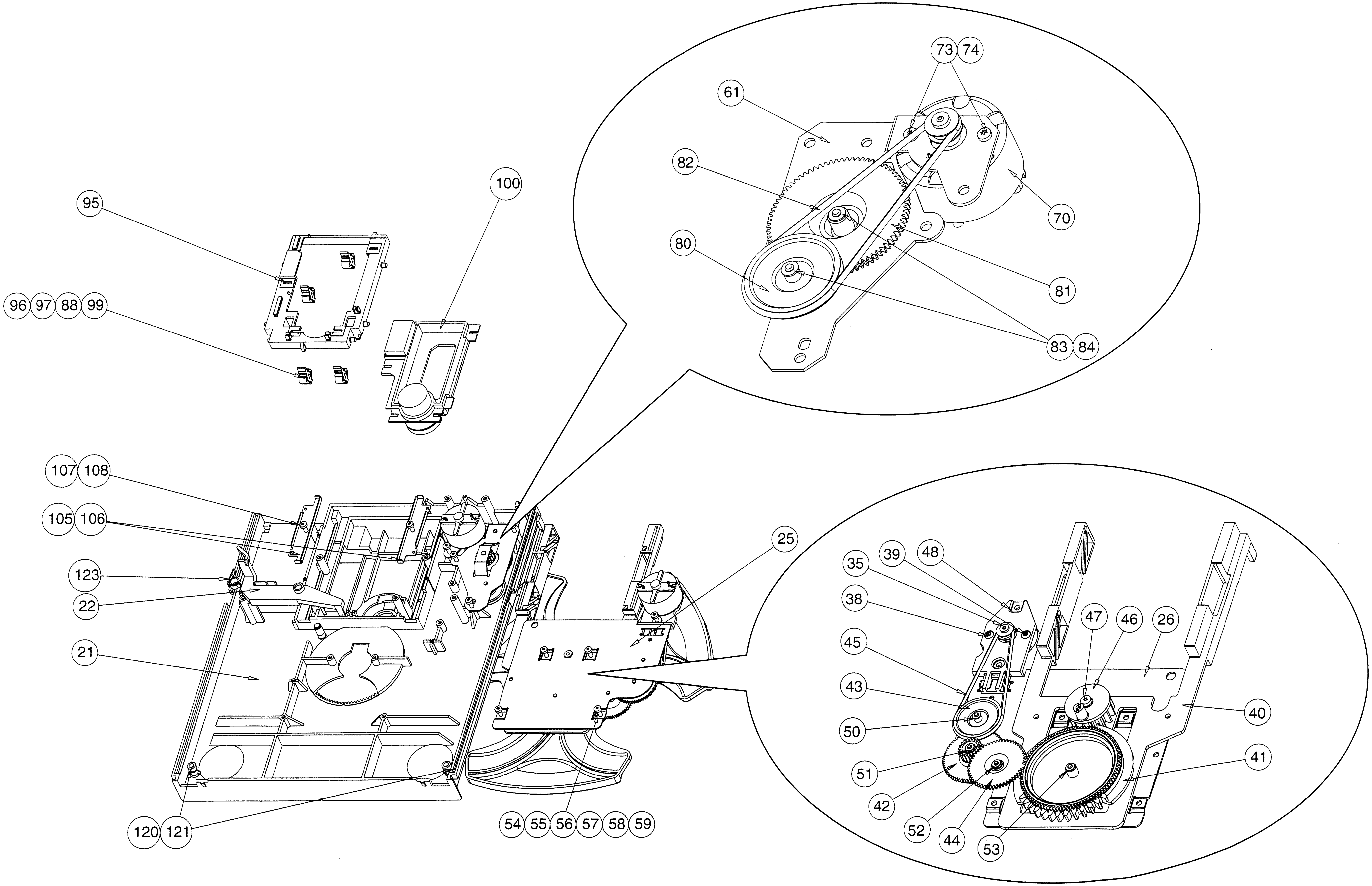
11
12
13
14
15
A
B
C
D
E
F
G
7851
TDA1311
Continuous Calibration DAC
FREQUENCY DIVIDER
RIGHT CHANNEL REGISTER
LEFT CHANNEL REGISTER
CONTROL AND TIMING
VREF
Vor 8
Vol 6
VDD
BCK
WS
DATA
GND
GNDA
3832 470R
3865
3866 470R
MP819
P834
+5V
100R
3869
4.75V
MP836
2851 100n
2852 470u
3855 15K
MP880
2857
2858 100n
3720 10R
3854 18K
only for TDA1545
IREF
to 1805
2860 10u
2861 10u
3858 22K
3859 22K
470R 3860
470R 3861
2862 2n2
2863 2n2
MP854
MP857
2830 100n
CD-TEXT INFO
4V
DQSY
3.3ms
SCLK
SRDT
only during TOC-reading
from kill-circuitry on part 1
KILLL
9804
9805
EBUGND
KILLR
9806
COAX2
COAX1
IREF
from digital-out circuitry
3872 10K
3874 10K
+4V
SCL
SILD
SDA
MP863
7874 BC547B
3876 220K
3875 10K
MP869
+4V
+5V
3726 (only stuffed, if 1805 -> 18pin)
3725 (only stuffed, if 1805 -> 15 pin)
10K
foolproof resistors
9800 @
MP865
MP802
7875
BC547B
3898 560R
3899 180R
2880 10n
3870 560R
MP866 1880
3721 470R
2891
2882 @ 22n 10u
3878 10K
CARR_SW
TRAY SW
CDM-POS
1882
1880
1881
MP866
MP868
MP867
6873
6871
6872
6874
1N4148
INNERSW1
INNERSW2
7873
HEF4094BP
VSS
Os
O7
O6
O5
O4
O3
O2
O1
O0
D
DATA
SHR_CL
STR_OUT
STR
5V
VDD
MP803
2872 100n
3880 330R
3881 10K
2874 22n
3882 47K
3879 10K
3851 3R3
MP871
+10V
2873 100n
3883 100K
3884 3K9
2875 22n
2829 10u
3885 100K
3886 47K
0V
2 0V
10V
Power-on Reset
2881 4u7
3714 10K
3713 100K
3715 100K
7812 BC547B
for provision only
3896 10K
+10V
MP801
3887 220R
2876 470u
6875 BZX79-C5V1
3877 10K
3871 10K
3888 10K
2877 82p
2878 220p
2879 220p
to 7800 on part 1
MP856
GNDA
MP899
MP808
MP805
MP806
MP811
MP810
MP809
MP807
MP804
PORE
DIGout/KILL
GND
SRDT
DQSY
uP_CLK
GND
COAX1/IREF/+5
COAX2/KILLR/EBU
GEBU/KILLL
LEFT
GNDA
RIGHT
+5V
GND
+10V
SW_INFO
STR_OUT
SHR_CL
SICL
DATA
SILD
GND
PORE
OE_LATCH
CD-TEXT
BASIC VERSION
1805
to connector board on rear side of module
@... for provision only

1805	G14
1876	E3
1878	F3
1880	D8
1881	E8
1882	D8
2829	F6
2830	B12
2851	C8
2852	C8
2853	B2
2854	C2
2857	C9
2858	C9
2860	A10
2861	B10
2862	A11
2863	B11
2864	D2
2865	D3
2870	E4
2871	F4
2872	G10
2873	F6
2874	E6
2875	F6
2876	E12
2877	G11
2878	G11
2879	G11
2880	D12
2881	G8
2882	D7
3700	B2
3701	B2
3702	B2
3703	A2
3704	A2
3705	A2
3706	A4
3707	B4
3708	B4
3711	A4
3712	C3
3713	G8
3714	G8
3715	G8
3716	D2
3717	C2
3720	C9
3725	D15
3726	C15
3809	C2
3832	B6
3851	E6
3854	B9
3855	C8
3858	A10
3859	B10
3860	A10
3861	B10
3865	B6
3866	C6
3868	C4
3869	C8
3870	E12
3871	E11
3872	B13
3874	B13
3875	C12
3876	C11
3877	E11
3878	D7
3879	E6
3880	E6
3881	E6
3882	E7
3883	F7
3884	F6
3885	F7
3886	F7
3887	E12
3888	E12
3896	G10
3898	D12
3899	D12
5802	C3
6871	D8
6872	E8
6873	D8
6874	E8
6875	F12
7812	G8
7851	A6
7871	E5
7873	D10
7874	C11
7875	D12
7876	A2
9800	D12
9803	C3
9804	B14
9805	B14
9806	B14
9808	A10
9809	A10
9810	B10
9811	B10
9812	A2
MP801	E12
MP802	D13
MP803	F10
MP804	G13
MP805	F13
MP806	F13
MP807	G13
MP808	F13
MP809	G13
MP810	G13
MP811	F13
MP819	C6
MP822	E4
MP823	E4
MP824	F4
MP825	F4
MP833	C5
MP834	B5
MP835	B5
MP836	C8
MP854	A12
MP856	E13
MP857	B12
MP863	C11
MP865	D12
MP866	D8
MP867	E8
MP868	E8
MP869	C11
MP871	E6
MP880	C9
MP881	A2
MP882	A2
MP883	B2
MP884	B2
MP885	B2
MP886	A4
MP887	B4
MP888	B4
MP889	B4
MP890	C2
MP891	D4
MP892	D4
MP899	F14

EXPLODED VIEW (3CDC MODULE)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123
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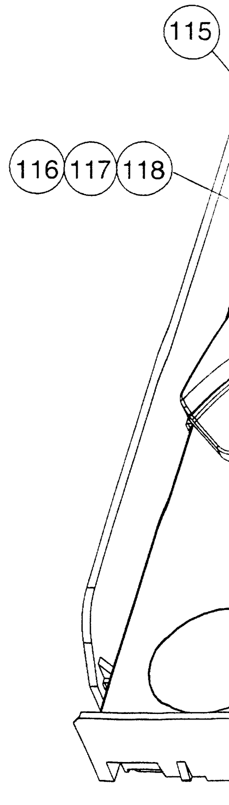
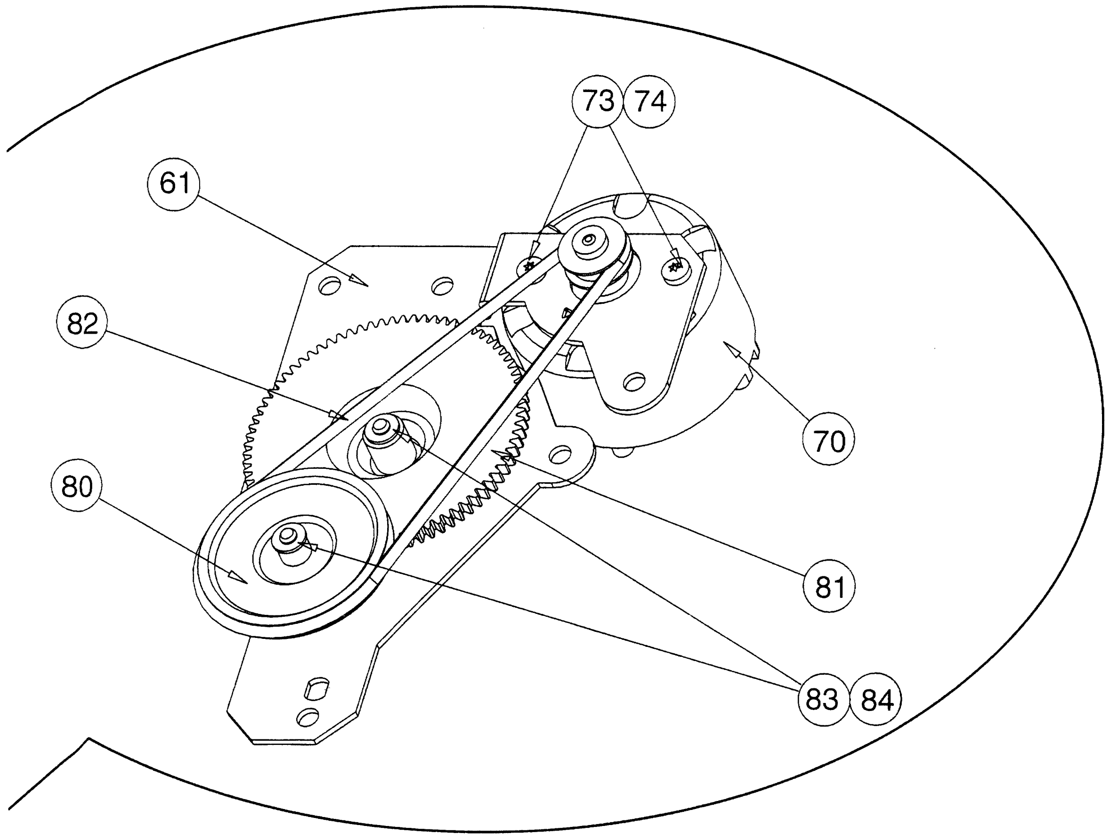

115
116
117
118

MECHANICAL PARTS

	4822 390 10136
3	4822 463 11008
4	4822 463 11009
21	4822 441 11615
22	4822 402 10088
38	4822 502 12548
39	4822 502 12548
40	4822 463 11011
41	4822 522 10509
42	4822 522 10492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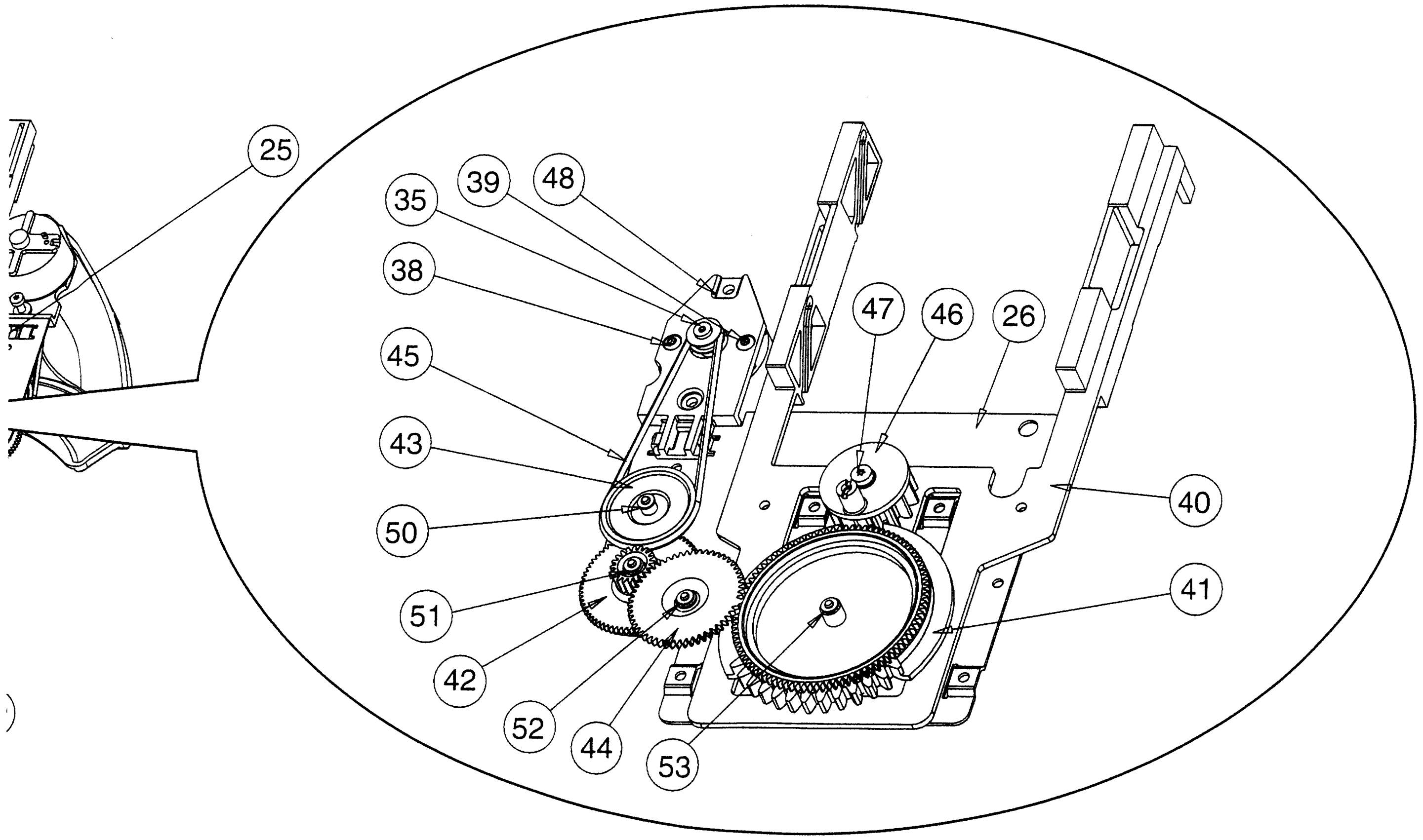
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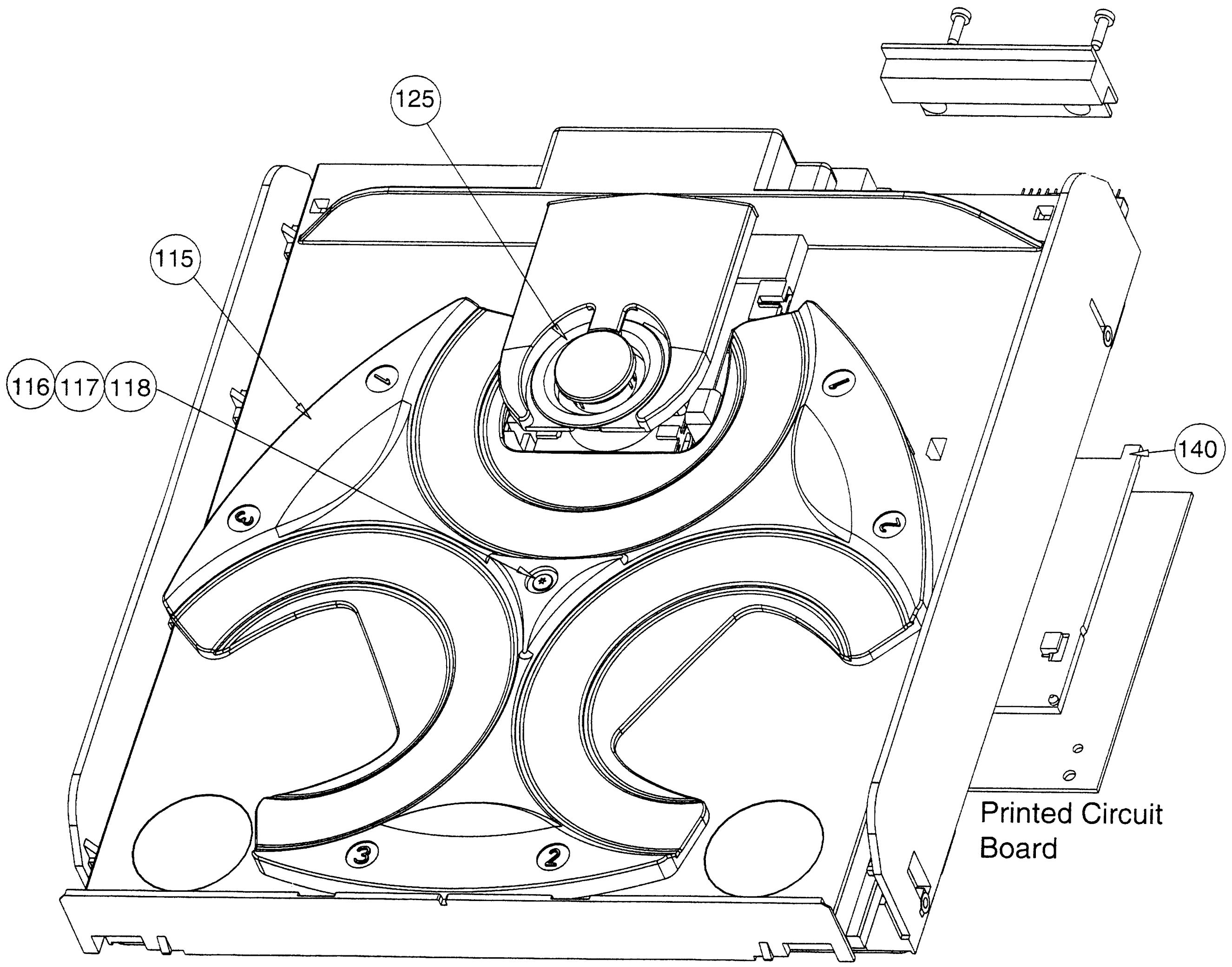

125
115
116
117
118
140
Printed Circuit Board

MECHANICAL PARTSLIST 3CDC MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)
3	4822 463 11008	GUIDE LEFT
4	4822 463 11009	GUIDE RIGHT
21	4822 441 11615	DRAWER
22	4822 402 10088	BRACKET TUMBLER
38	4822 502 12548	SCREW M2,6X3,5
39	4822 502 12548	SCREW M2,6X3,5
40	4822 463 11011	SLIDE
41	4822 522 10509	CONTROL DISC
42	4822 522 10492	GEAR WHEEL
43	4822 528 10937	PULLEY
44	4822 522 10493	IDLER WHEEL
45	4822 358 10115	BELT
46	4822 466 10735	ECCENTRIC GEAR WHEEL
50	4822 532 12364	WASHER
51	4822 532 12364	WASHER
52	4822 532 12364	WASHER
53	4822 532 12364	WASHER
35	4822 361 10753	CARROUSEL MOTOR
70	4822 361 10753	CARROUSEL MOTOR

ELECTRICAL PARTSLIST 3CDC MODULE

MISCELLANEOUS

1800	4822 267 51453	Flex Foil connector 12pin
1805	4822 265 10979	Flex Foil connector 15pin
1805	4822 265 11182	Flex Foil connector 23pin
1805	4822 265 11184	Flex Foil connector 18pin
1806	4822 265 10981	Flex Foil connector 15pin
1806	4822 267 10757	Flex Foil connector 23pin top entry
1806	4822 265 11185	Flex Foil connector 18pin top entry
1860	4822 265 11183	Flex Foil connector 4pin side entry
1880	4822 276 13503	Switch
1881	4822 276 13503	Switch
1882	4822 276 13503	Switch
8002	4822 320 11974	Flex Foil 15pin length= 190mm
8002	4822 320 12229	Flex Foil 18pin length= 190mm
8002	4822 320 12231	Flex Foil 23pin length= 190mm
8002	4822 320 12232	Flex Foil 15pin length= 480mm

CAPACITORS

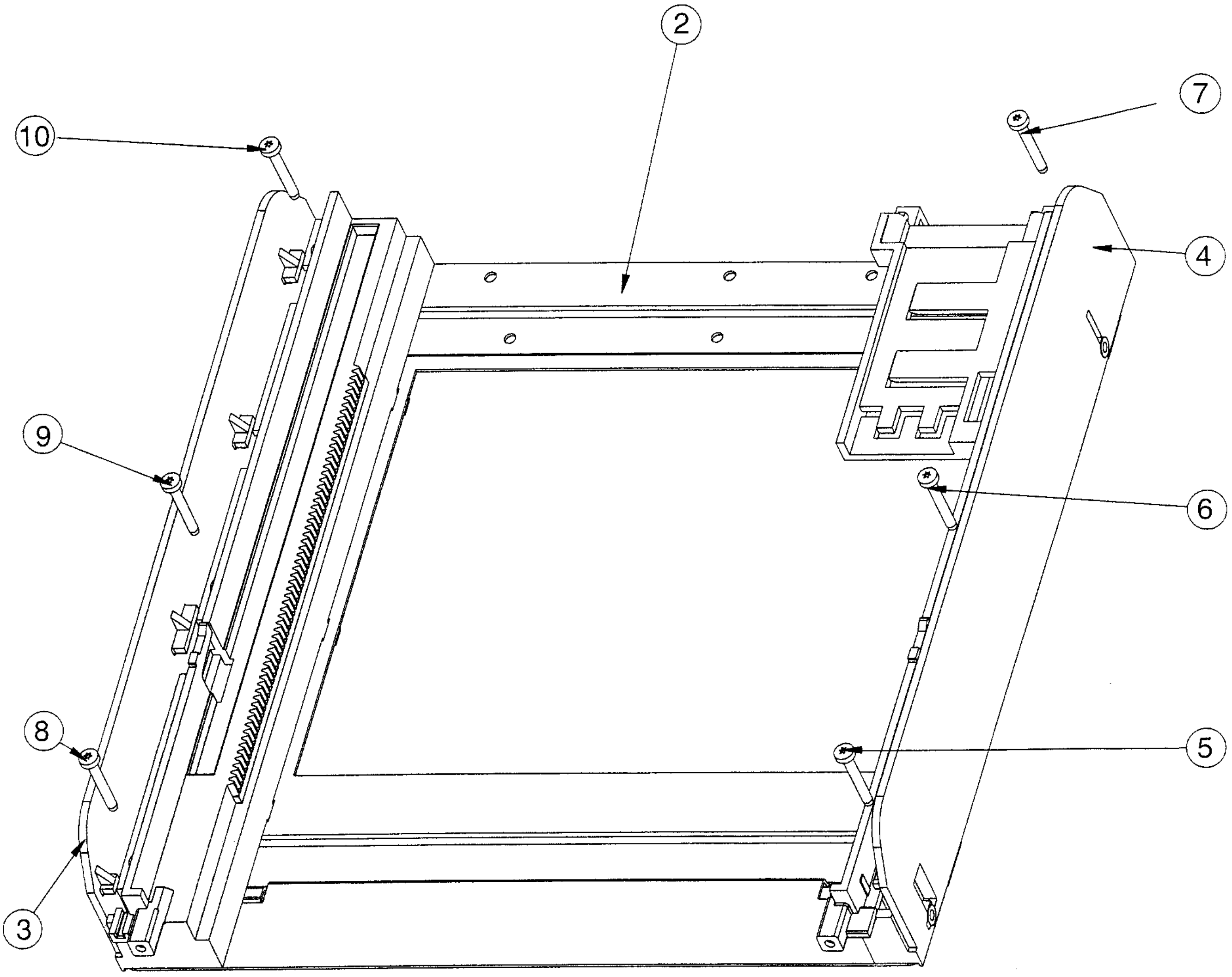
2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 126 12787	330pF	10%	50V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12878	1,5nF	10%	16V
2808	4822 122 10466	220pF	10%	50V
2809	4822 126 12882	100nF	20%	50V
2810	4822 122 10459	560pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2812	4822 122 10319	82pF	5%	50V
2813	4822 122 10319	82pF	5%	50V
2814	4822 122 33849	150pF	10%	50V
2815	4822 122 33192	27pF	5%	50V
2817	4822 122 33849	150pF	10%	50V
2819	4822 122 33848	47pF	5%	50V
2820	4822 122 33848	47pF	5%	50V
2821	4822 122 10462	15pF	5%	50V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12882	100nF	20%	50V
2826	4822 124 23624	470µF	20%	16V
2827	4822 126 12882	100nF	20%	50V
2828	4822 126 12882	100nF	20%	50V
2829	4822 124 41579	10µF	20%	50V
2830	4822 126 12882	100nF	20%	50V
2831	4822 124 12032	4,7µF	20%	50V
2832	4822 124 12032	4,7µF	20%	50V
2833	4822 122 33191	22pF	5%	50V
2834	4822 122 33191	22pF	5%	50V
2835	4822 126 12882	100nF	20%	50V
2837	4822 126 12882	100nF	20%	50V
2838	4822 126 12882	100nF	20%	50V
2839	4822 126 12882	100nF	20%	50V
2840	4822 126 12882	100nF	20%	50V
2841	4822 122 10574	1,2nF	10%	16V
2842	4822 121 51387	10nF	20%	16V
2843	4822 126 12882	100nF	20%	50V
2844	4822 122 10574	1,2nF	10%	16V
2845	4822 121 51387	10nF	20%	16V
2846	4822 126 11585	22nF	20%	50V
2847	4822 126 12882	100nF	20%	50V

CAPACITORS

2849	4822 126 11585	22nF	20%	50V
2850	4822 122 33197	1nF	10%	50V
2851	4822 126 12882	100nF	20%	50V
2852	4822 124 80857	470µF	20%	16V
2853	4822 126 12882	100nF	20%	50V
2856	4822 122 33848	47pF	5%	50V
2859	4822 126 12882	100nF	20%	50V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 126 12339	2,2nF	10%	16V
2863	4822 126 12339	2,2nF	10%	16V
2864	4822 122 33848	47pF	5%	50V
2866	4822 126 12882	100nF	20%	50V
2867	4822 122 33848	47pF	5%	50V
2868	4822 126 12882	100nF	20%	50V
2869	4822 126 12882	100nF	20%	50V
2870	4822 126 12882	100nF	20%	50V
2871	4822 126 11585	22nF	20%	50V
2872	4822 126 12882	100nF	20%	50V
2873	4822 126 12882	100nF	20%	50V
2874	4822 126 11585	22nF	20%	50V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 80857	470µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 122 10466	220pF	10%	50V
2880	4822 121 51387	10nF	20%	16V
2884	4822 126 12882	100nF	20%	50V
2887	4822 126 12882	100nF	20%	50V
2890	4822 124 23624	470µF	20%	16V
2891	4822 124 12125	10µF	20%	16V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3701	4822 116 83883	470Ω	5%	0,16W
3702	4822 116 83883	470Ω	5%	0,16W
3703	4822 116 83883	470Ω	5%	0,16W
3704	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 52195	47Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3710	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3717	4822 116 80176	1Ω	5%	0,5W
3720	4822 116 52176	10Ω	5%	0,5W
3721	4822 116 83883	470Ω	5%	0,16W
3725	4822 116 83864	10kΩ	5%	0,5W
3726	4822 116 83864	10kΩ	5%	0,5W
3800	4822 116 52239	120kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52239	120kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3804	4822 116 52291	56kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 52175	100Ω	5%	0,5W
3810	4822 050 11002	1kΩ	5%	0,2W
3812	4822 116 83884	47kΩ	5%	0,16W
3813	4822 116 83864	10kΩ	5%	0,5W
3816	4822 116 52269	3,3kΩ	5%	0,5W



MECHANICAL PARTSLIST 3CDC MODULE

73	4822 502 12548	SCREW M2,6X3,5
74	4822 502 12548	SCREW M2,6X3,5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10894	SUPPORT
96	4822 325 50215	SUSPENSION
97	4822 325 50215	SUSPENSION
98	4822 325 50215	SUSPENSION
99	4822 325 50215	SUSPENSION
100	4822 691 10615	CD DRIVE VAM1201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
120	4822 532 51756	GROMMET
121	4822 532 51756	GROMMET
123	4822 402 10085	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP
140	4822 466 10734	PLATE

ELECTRICAL PARTSLIST 3CDC MODULE

RESISTORS

3817	4822 116 83961	6,8kΩ	5%	0,16W
3818	4822 116 83864	10kΩ	5%	0,5W
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52269	3,3kΩ	5%	0,5W
3821	4822 116 52269	3,3kΩ	5%	0,5W
3822	4822 116 52257	22kΩ	5%	0,5W
3823	4822 116 52269	3,3kΩ	5%	0,5W
3824	4822 116 52269	3,3kΩ	5%	0,5W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52278	390kΩ	5%	0,5W
3828	4822 116 52257	22kΩ	5%	0,5W
3830	4822 116 52235	1MΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83883	470Ω	5%	0,16W
3833	4822 116 83864	10kΩ	5%	0,5W
3834	4822 116 52283	4,7kΩ	5%	0,5W
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52245	150kΩ	5%	0,16W
3840	4822 116 52245	150kΩ	5%	0,16W
3841	4822 116 83961	6,8kΩ	5%	0,16W
3842	4822 116 83864	10kΩ	5%	0,5W
3843	4822 116 52303	8,2kΩ	5%	0,5W
3844	4822 116 52226	560Ω	5%	0,5W
3844	4822 116 83883	470Ω	5%	0,16W
3845	4822 116 83864	10kΩ	5%	0,5W
3846	4822 116 52303	8,2kΩ	5%	0,5W
3847	4822 116 52228	680Ω	5%	0,5W
3847	4822 116 83883	470Ω	5%	0,16W
3848	4822 116 52303	8,2kΩ	5%	0,5W
3849	4822 116 52303	8,2kΩ	5%	0,5W
3850	4822 116 83883	470Ω	5%	0,16W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10338	3,3Ω		NFR25
3853	4822 052 10338	3,3Ω		NFR25
3856	4822 116 52219	330Ω	5%	0,5W
3856	4822 116 80176	1Ω	5%	0,5W
3857	4822 050 11002	1kΩ	5%	0,2W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83883	470Ω	5%	0,16W
3861	4822 116 83883	470Ω	5%	0,16W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3865	4822 116 83883	470Ω	5%	0,16W
3866	4822 116 83883	470Ω	5%	0,16W
3867	4822 116 52234	100kΩ	5%	0,5W
3868	4822 116 52191	33Ω	5%	0,5W
3869	4822 116 52175	100Ω	5%	0,5W
3870	4822 116 52226	560Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83874	220kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W

RESISTORS

3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 052 10221	220Ω	5%	
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 116 83883	470Ω	5%	0,16W
3891	4822 116 52272	330kΩ	5%	0,5W
3893	4822 116 52257	22kΩ	5%	0,5W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3896	4822 116 83864	10kΩ	5%	0,5W
3897	4822 116 52226	560Ω	5%	0,5W
3898	4822 116 52226	560Ω	5%	0,5W
3899	4822 116 52213	180Ω	5%	0,5W

COILS

1810	4822 242 10849	CRYSTAL 8MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5801	4822 157 71249	4,7µH

DIODES

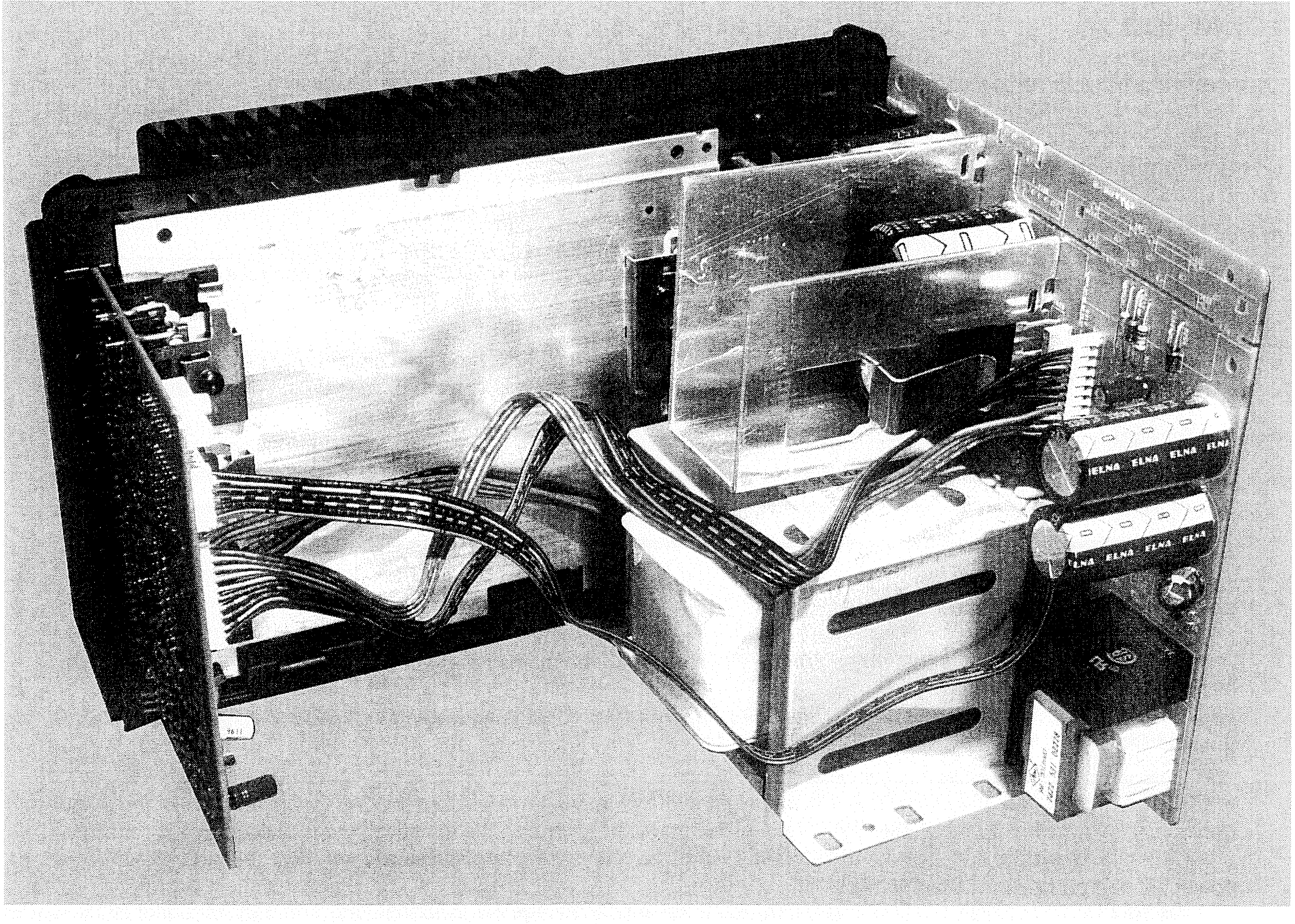
6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1

TRANSISTORS

7808	4822 130 41344	BC337-40
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7800©	4822 209 12752	SAA7378GP (Signal Processor CD7)
7801©	5322 209 11517	PC74HCU04T (HF Amplifier)
7806	4822 209 32852	TDA7073A/N2 (Servo Driver)
7807	4822 209 32852	TDA7073A/N2 (Motor Driver)
7810	4822 130 10845	OPTICAL OUT UNIT
7851	4822 209 32421	TDA1311A/N2(DAC)
7871	4822 209 32852	TDA7073A/N2 (Motor Driver)
7873	5322 209 10421	HEF4094BP (Shift Register)
7876	4822 209 16143	LC89170M (CD Text)



POWER 4 Module

(4 Channel Version)

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Circuit diagram Supply part 11-7
Component layout 11-8
Circuit diagram Power stage 11-9
Partslist...11-10

CIRCUIT DESCRIPTION FOR POWER4-MODULE

Supply-part

***General** (pos. numbers refer to circuit diagram chapter 11-7)*

The primary circuitry depends on the version:

- Versions with fixed primary voltage: 100VAC for /26
  120VAC for /37
  220-240VAC for /22/25/30/33/34
  Versions /22/25/26/37 use radial type-fuse 1201, versions /30/33/34 use glass tube fuse 1202.
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- Version with switchable primary voltage: 110-127/220-240VAC for /21
  In version /21 voltage selector 1210 is built-in and each primary winding is protected separately (fuses 1201 and 1200).
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- European versions – "*low power standby feature*"
  For detailed description see below.

Circuit details:

- **Low power standby feature**

An additional small standby transformer, connected in series to the mains transformer, reduces power consumption in standby-mode.
In case power is switched on, the control line ECO is low → relay 1208 is activated → standby transformer 5211 is shortened and out of work.
When the set is switched off (standby) the control line ECO is high → relay 1208 is not activated → standby transformer 5211 is now connected in series to the primary winding of the mains transformer 1008. As the impedance of the standby transformer is much higher than the impedance of the mains transformer, the mainsvoltage is divided by approx. 85% (standby transformer) to 15% (mains transformer). Thus the mains transformer delivers very low secondary voltage → power consumption is less than 100mW.
Via standby transformer and rectifiers 6209-6212 the supply voltage +C is substituted. The 5,6V regulator is still working and so the microprocessor is kept running.

- **DC voltages +A, +B1/+B2, +C**

These voltages supply the Super Class G amplifier, described later in this chapter.
The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several "tricky" details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A

Common full wave rectifying with bridge rectifier 6201, using 100% secondary winding of mains transformer (pin 11-15).

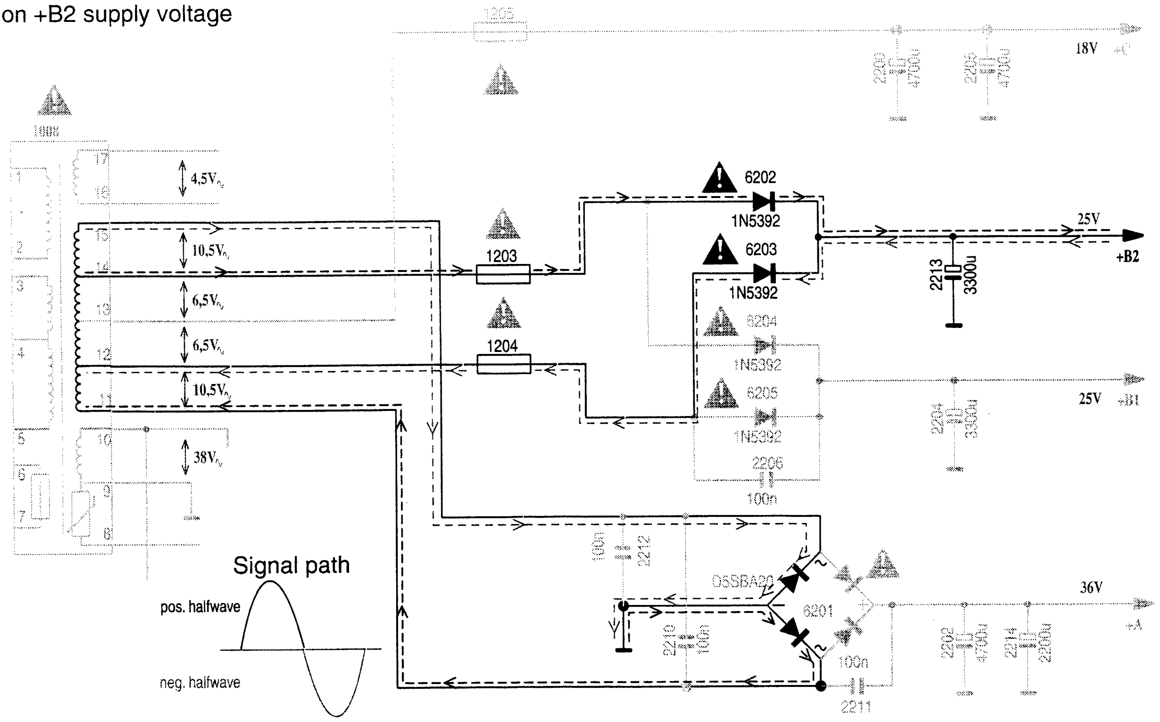
Generation of +B1/+B2

The power supply is designed to cover both, 2-channel and 4-channel application.
While for 2-channel application only one supply voltage +B1 is sufficient, 4-channel application requires an additional supply part +B2 which supplies the Center/Surround-amplifiers and the +12V-regulator (current required by 4 amplifiers would overload a single rectifier).

The supply for 2-channel versions consists of one full wave rectifier:
– 2 diodes of bridge rectifier 6201, with 6204/6205 for generation of +B1
– +B2 is connected in parallel with a bridge wire.

The supply for 4-channel versions consists of two separate full wave rectifiers:
– 2 diodes of bridge rectifier 6201, with 6204/6205 (for +B1) and
– 2 diodes of bridge rectifier 6201, with 6202/6203 (for +B2),
using approx. 70% secondary winding of mains transformer (pin 11-14 respectively pin 12-15).
As example for generation of +B2 see picture 1.

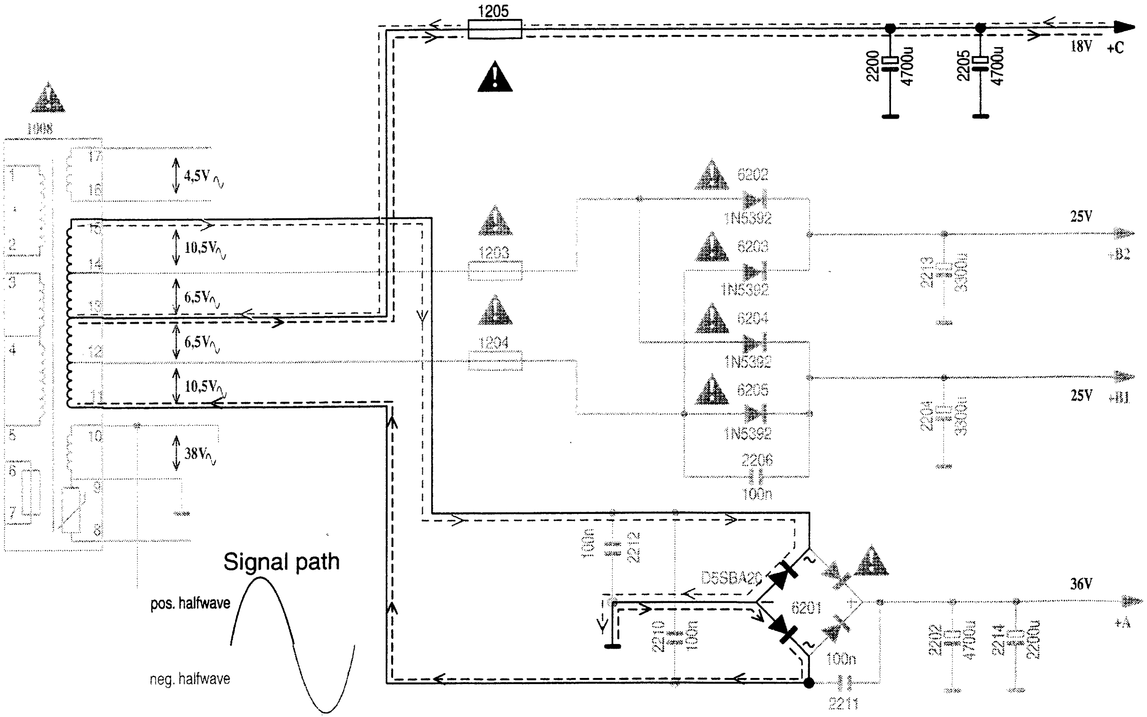
Generation +B2 supply voltage


1205
18V +C
2200 4700u
2205 4700u
1008
17
16
15
14
13
12
11
10
9
8
1
2
3
4
5
6
7
4,5V
10,5V
6,5V
6,5V
10,5V
38V
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V
+B2
2213
3300u
25V +B1
2204
3300u
100n
2212
D5SBA20
6201
2210
100n
100n
2211
36V
+A
2202
4700u
2214
2200u
Signal path
pos. halfwave
neg. halfwave

picture 1

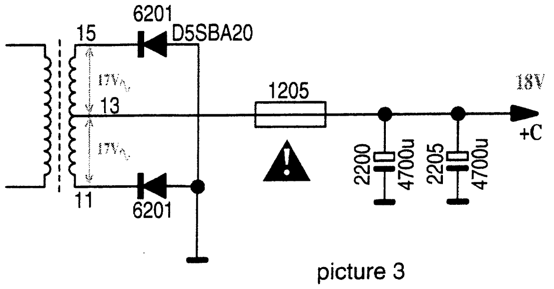
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.


1205
18V +C
2200
4700u
2205
4700u
1008
17
16
15
14
13
12
11
10
9
8
1
2
3
4
5
6
7
4,5V
10,5V
6,5V
6,5V
10,5V
38V
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V +B2
2213
3300u
25V +B1
2204
3300u
100n
2212
D5SBA20
6201
2210
100n
100n
2211
36V
+A
2202
4700u
2214
2200u
Signal path
pos. halfwave
neg. halfwave

picture 2

Simplified


6201
D5SBA20
15
17V
13
17V
11
6201
1205
18V
+C
2200
4700u
2205
4700u

picture 3

Circuit details (continoued):

- **Supply voltages for FTD** (**F**luorescent **T**ube **D**isplay)
  The FTD requires two supply voltages, delivered by separate windings of the mains transformer:
  – 4,5VAC for FTD heating (transformer pin 16/17)
  – -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**
  Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.
  Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**
  The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**
  In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line.
  In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a save shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part

+12V-regulator *(pos. numbers refer to circuit diagram chapter 11-9)*

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**
  Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF
  If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch trough and supply the base of 7221. Consequently 7221 swiches trough too.
  Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

  If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**
  Key components are power-transistor 7221, reference diode 6221 and transistor 7223.
  After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).
  In normal operating mode 7227 is always switched trough as described above.

- **Protections:**
  In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.
  Restarting is only possible with power OFF→ ON.

  In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

  These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.
  Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

Circuit details (continoued):

Fan-circuit:

Is a provision for versions with not enough cooling-capacity (e.g. MICRO-sets).

There are three modes: (off, low and high) which are controlled by: - an NTC located on the cooling-plate and
- info-line TURBOFAN from the amplifier-supply.

OFF: If NTC 3250 has high resistance, 7236 is conductive → 7237 is blocked → fan is not running.

LOW: When the NTC becomes hot the resistance decreases. At approx. 60°C 7236 blocks. 7237 becomes conductive → fan starts running. The fan is supplied is approx. 8V because divider 3244/3245 keeps base of 7237 at typ. 9V. 3246 works as a hysteresis resistor. Just when the temperature decreases to about 50°C the fan will be switched off.

HIGH: When the set is driven with very high output-levels, +B or even +A is switched as supply voltage to the power stages. Via 6244 the level of the TURBOFAN-line becomes high. Base of 7237 increases and in turn the emitter. This results in a higher fan-speed. The voltage on the fan can rise up to +12V - depending on the music.

Amplifier:

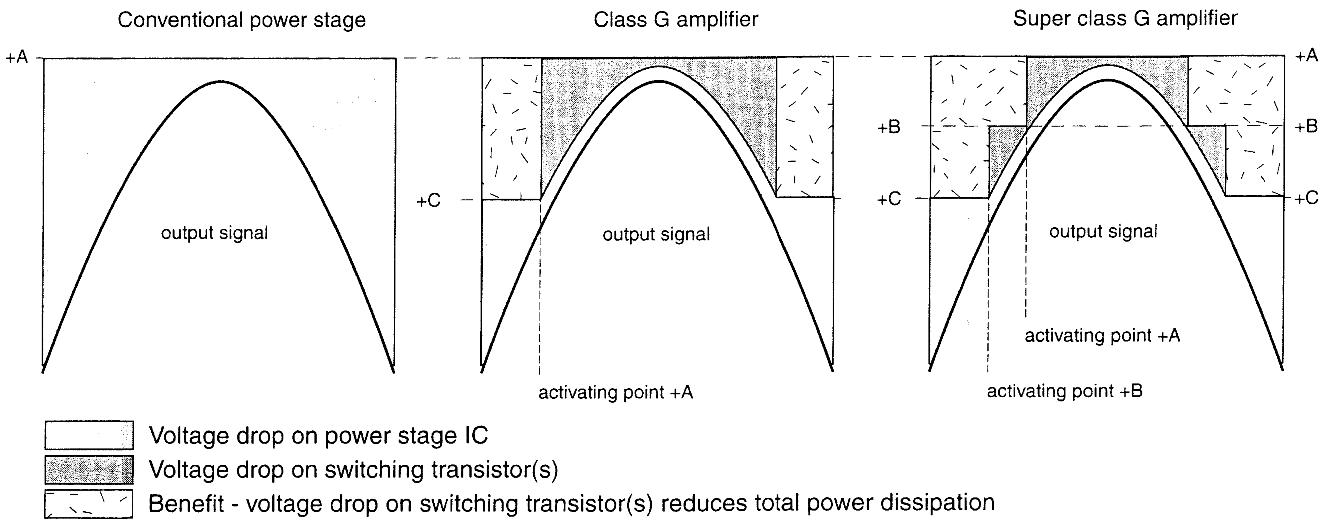
Attention: In the POWER 4 module the power amplifier IC AN7164 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

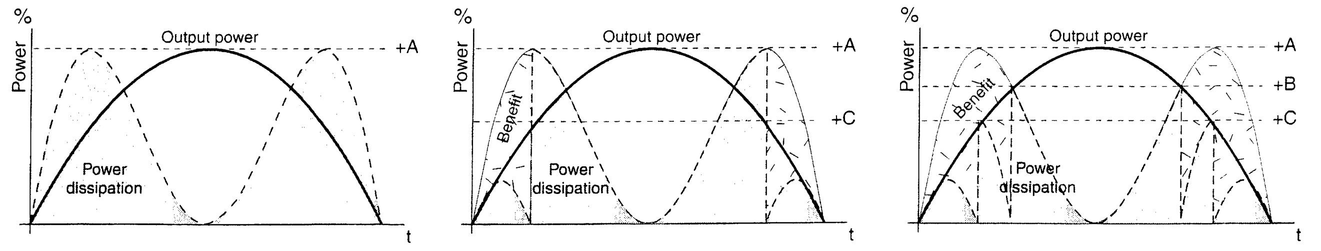
- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the µP.
  High level (approx. 4,5V): power amplifiers switched on
  Low level (approx. 0V): power amplifiers switched off

- Super class G - operation

  The power amplifiers operate as so-called super class G - amplifiers:
  The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
  Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
  ⇒ +C (+18V) for low output power
  ⇒ +B (+25V) for medium output power
  ⇒ +A (+36V for high output power

Principle / benefit of Super Class G


Conventional power stage
Class G amplifier
Super class G amplifier
+A
+B
+C
output signal
activating point +A
activating point +B
Voltage drop on power stage IC
Voltage drop on switching transistor(s)
Benefit - voltage drop on switching transistor(s) reduces total power dissipation



- advantages: - best efficiency
  - less power drawn from the mains transformer than by conventional operating amplifiers reduces transformer heating.
  - reduced power dissipation at the amplifier ICs results in
    - less junction temperature and better reliability
    - possibility of higher output power with smaller cooling fin
    - smaller size

- Functional description of the super class G - circiuitry used in Power4-module

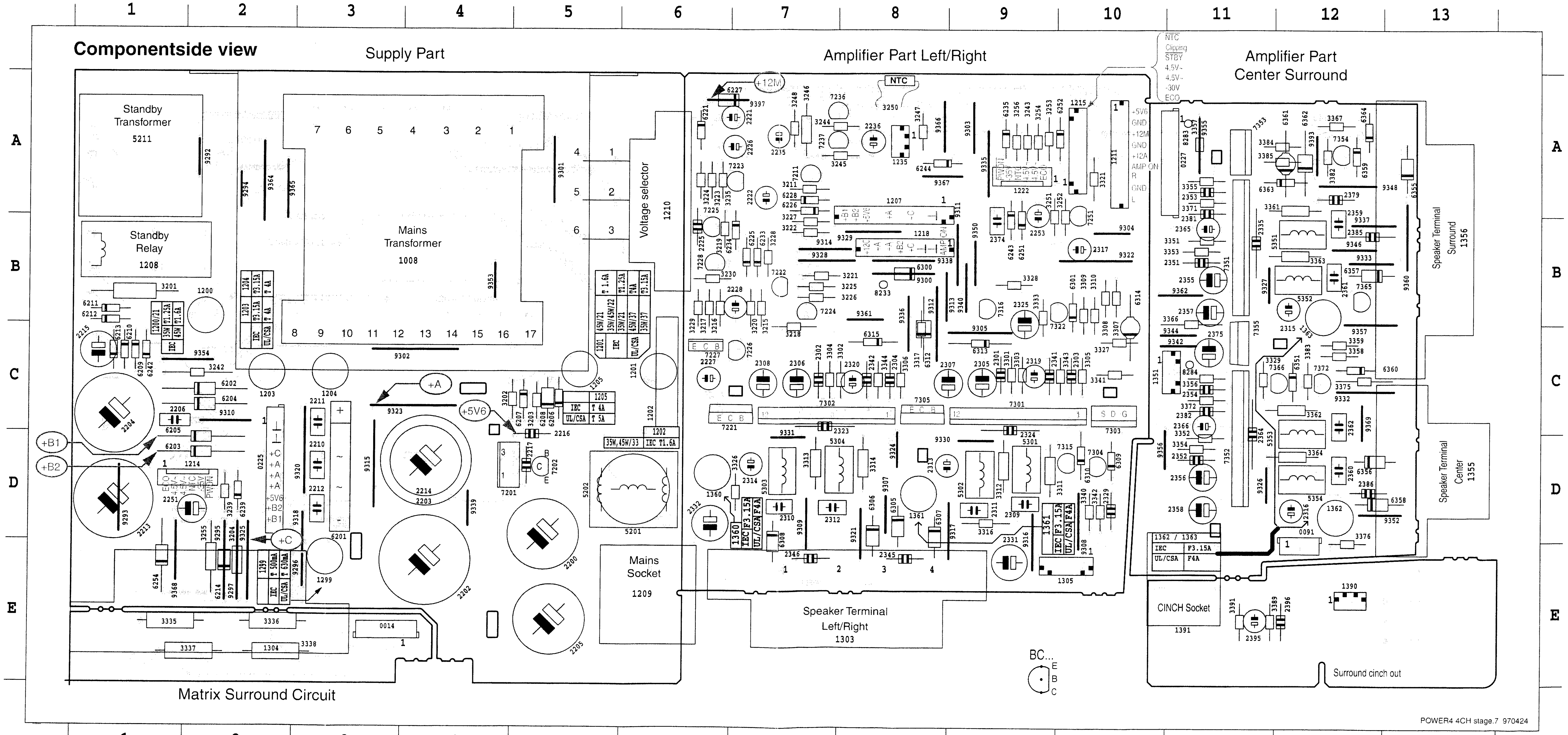
  The DC-level on the amplifier output pins is normally Vcc/2.
  With low signals +C is supplying the amplifiers via decoupling diode 6312. The DC-level on the output pins is therefore approx. 8,6V and approx. 8V on the base of 7315.
  When the output signal increases, also DC-level on base of 7315 increases via diodes 6305, 6306, 6307 and 6308. At a certain output power 7315 becomes slightly conductive and enables low base current for 7304 which becomes conductive too and pulls gate of FET 7303 up to a more positive level. Thus FET 7303 begins to switch through and connects the higher DC supply +B1 slowly to the power stages.
  This does not end up in a hard switching but in a smooth regulating because Vcc is coupled back to the emitter of 7315 via Zener diode 6310. As soon as Vcc increases also the level on emitter 7315 is increased by a 3,9V lower level than Vcc.
  When the output power is increased further +B1 would not be high enough to enable undistorted output signal. The more the output level increases the more increases the DC-level on base of 7315 which causes the transistor more and more conducting until the summary of the voltage drop on 3340+E/B 7304+3342 becomes approx. 1,4V. Now the necessary VBE for a darlington-type transistor is obtained, 7305 begins to switch through and connects the again higher DC supply +A slowly to the power stages. 7305 regulates +A, same as described before for +B.
  7322 and 7316 switch the ripple capacitor 2355, dependent on the output power.
  With low output power the DC-level on base 7322 is approx. 8V. Via Zener diode 6310 and resistor 3333 the emitter is pulled to Vcc (+C at low levels). 7322 is switched through and in turn 7316. The ripple capacitor 2325 is connected to ground and functions as in normal amplifiers. Hum is suppressed and good S/N-ratio is guaranteed even during silent music passages.
  When the supply voltage has to be switched to a higher level the DC-level of the ripple capacitor has to increase in the same relation, otherwise the reference voltages inside the IC would not fit to the actual Vcc. Because of the different delays this relation cannot be obtained and a continuously connected capacitor to the ripple input would cause distortion. For that reason the ripple capacitor 2325 is disconnected as soon as the output power exceeds a certain value. When the output signal increases, also DC-level on base of 7322 increases via diodes 6305, 6306, 6307 and 6308. 7322 blocks and in turn 7316. The ripple capacitor 2325 is disconnected from ground. The circuitry is designed so that 2325 is disconnected just before 7303 begins to switch +B through (see above).

- For Center/Surround-amplifier the function of the Super Class G circuit is similar. Instead of +B1 there +B2 is connected.

- For the /37-versions with two channel-application the so called MATRIX SURROUND is added. The 2 surround-speakers are added in a way, that in case of STEREO a high signal can be measured (up to 10W per speaker at 6 Ohm). In MONO only a few 100mW are available. Result: The widening of the STEREO base is increased without any additional electronic or amplifier.

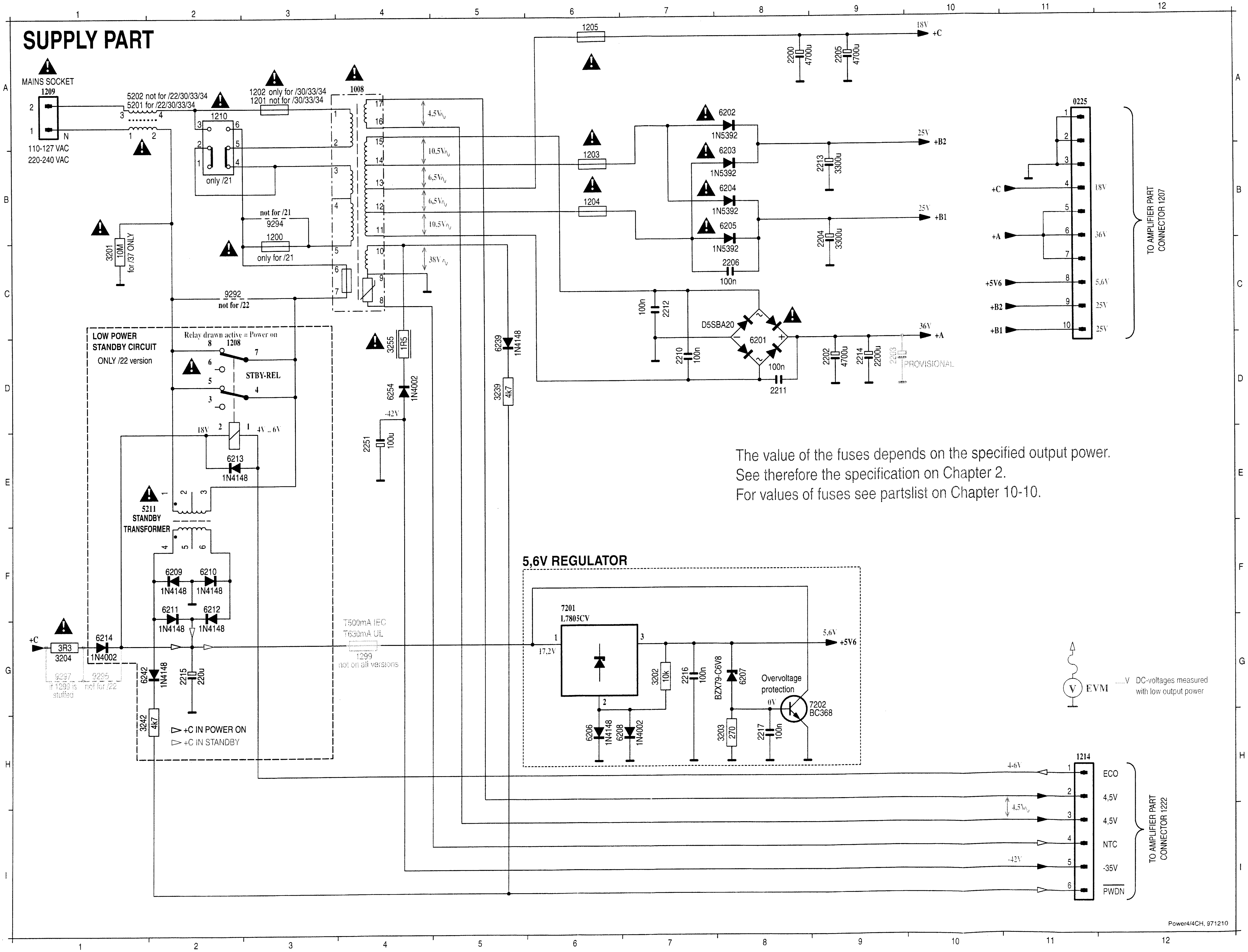
- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system (e.g. FB206,FB208).

0014 E 3	1211 A 10	1362 D 12	2215 C 1	2303 C 10	2319 C 9	2353 A 11	2379 A 12	3218 C 7	3242 C 2	3302 C 8	3321 A 10	3351 B 11	3371 A 11	5303 D 7	6210 C 1	6243 B 9	6314 C 10	7211 A 7	7304 D 10	8284 C 11	9309 D 7	9325 E 2	9342 C 11	9365 A 2
0091 E 12	1214 D 2	1363 B 12	2216 D 5	2304 C 8	2320 C 8	2354 C 11	2381 A 11	3219 B 6	3243 A 9	3303 C 9	3326 D 7	3352 D 11	3372 C 11	5304 D 8	6211 B 1	6244 A 8	6315 C 8	7221 C 7	7305 C 8	9292 A 2	9310 C 2	9326 D 11	9344 C 11	9366 A 8
0225 D 2	1215 A 10	1390 E 12	2217 D 5	2305 C 9	2323 C 7	2355 B 11	2382 C 11	3220 B 7	3244 A 8	3304 C 7	3327 C 10	3353 B 11	3375 C 12	5351 B 12	6212 B 1	6251 B 9	6351 C 12	7222 B 7	7315 D 10	9293 D 1	9311 B 9	9327 B 11	9346 B 12	9367 A 8
0227 A 11	1218 B 8	1391 E 11	2221 A 7	2306 C 7	2324 C 9	2356 D 11	2385 B 12	3221 B 7	3245 A 8	3305 C 10	3328 B 9	3354 D 11	3376 E 12	5352 B 12	6213 C 1	6252 A 10	6355 A 13	7223 A 7	7316 B 9	9294 A 2	9312 B 8	9328 B 7	9348 A 12	9368 E 1
1008 A 4	1222 A 9	2200 D 5	2222 A 7	2307 C 8	2325 B 9	2357 B 11	2386 D 12	3222 B 7	3246 A 7	3306 C 8	3329 C 11	3355 A 11	3382 A 12	5353 C 12	6214 E 2	6254 E 1	6356 D 12	7224 B 7	7322 B 9	9295 E 2	9313 B 8	9329 B 8	9350 B 9	9369 C 12
1200 B 2	1235 A 8	2202 E 4	2225 B 6	2308 C 7	2329 D 10	2358 D 11	2395 E 11	3223 A 6	3247 A 8	3307 B 10	3333 B 9	3356 C 11	3383 C 12	5354 D 12	6221 A 6	6300 B 8	6357 B 12	7225 B 6	7351 B 11	9296 E 3	9314 B 7	9330 D 9	9352 D 12	9393 A 12
1201 C 6	1299 E 3	2203 D 4	2226 A 7	2309 D 9	2331 E 9	2359 B 12	2396 E 12	3224 A 6	3248 A 7	3308 B 10	3335 E 1	3357 A 11	3384 A 12	6201 D 3	6225 B 7	6301 B 10	6358 D 12	7226 C 7	7352 D 11	9297 E 2	9315 D 3	9331 D 7	9353 B 4	9397 A 6
1202 C 6	1303 E 8	2204 C 1	2227 C 6	2310 D 7	2332 D 6	2360 D 12	3201 B 1	3225 B 7	3250 A 8	3309 B 10	3336 E 2	3358 C 12	3385 A 12	6202 C 2	6226 A 7	6305 D 8	6359 A 12	7227 C 6	7353 A 11	9300 B 8	9316 E 9	9332 C 12	9354 C 2	
1203 C 2	1304 E 2	2205 E 5	2228 B 7	2311 D 9	2335 B 11	2361 B 12	3202 C 5	3226 B 7	3251 A 9	3310 B 10	3337 E 2	3359 C 12	3389 E 11	6203 D 2	6227 A 6	6306 D 8	6360 C 12	7228 B 6	7354 A 12	9301 A 5	9317 D 9	9333 B 12	9355 A 11	
1204 C 3	1305 E 10	2206 C 1	2235 A 7	2312 D 7	2341 C 9	2362 C 12	3203 C 5	3227 B 7	3252 B 10	3311 D 9	3338 E 2	3361 A 12	3391 E 11	6204 C 2	6228 A 7	6307 D 8	6361 A 12	7236 A 7	7355 C 11	9302 C 4	9318 E 3	9335 A 9	9356 D 10	
1205 C 5	1351 C 11	2210 D 3	2236 A 8	2313 D 8	2342 C 8	2364 D 11	3204 E 2	3228 B 7	3253 A 9	3312 D 9	3340 D 10	3362 C 12	5201 D 6	6205 D 2	6233 B 7	6308 E 7	6362 A 12	7237 A 7	7365 B 12	9303 A 9	9320 D 3	9336 B 8	9357 B 12	
1207 B 8	1355 D 13	2211 C 3	2251 D 2	2314 D 7	2345 E 8	2365 B 11	3211 A 7	3229 B 6	3254 A 9	3313 D 7	3341 C 10	3363 B 12	5202 D 6	6206 C 5	6234 B 7	6309 D 10	6363 A 12	7251 A 10	7366 C 12	9304 B 10	9321 D 8	9337 B 12	9360 B 13	
1208 B 1	1356 B 13	2212 D 3	2253 A 9	2315 B 12	2346 E 7	2366 C 11	3215 B 7	3230 B 6	3255 E 2	3314 D 8	3342 D 10	3364 D 12	5211 A 1	6207 C 5	6235 A 9	6310 D 10	6364 A 12	7301 C 9	7372 C 12	9305 C 9	9322 B 10	9338 B 8	9361 B 8	
1209 E 6	1360 D 6	2213 D 1	2301 C 9	2316 D 12	2351 B 11	2374 B 9	3216 B 6	3235 A 6	3256 A 9	3316 D 9	3343 C 10	3366 B 11	5301 D 9	6208 C 5	6239 D 2	6312 C 8	7201 D 4	7302 C 7	8233 B 8	9307 D 8	9323 C 4	9339 D 4	9362 B 11	
1210 A 5	1361 D 8	2214 D 4	2302 C 7	2317 B 10	2352 D 11	2375 C 11	3217 B 6	3239 D 2	3301 C 9	3317 C 8	3344 C 8	3367 A 12	5302 D 9	6209 C 1	6242 C 1	6313 C 9	7202 D 5	7303 C 10	8283 A 11	9308 D 10	9324 D 8	9340 B 9	9364 A 2	


Componentside view
Supply Part
Amplifier Part Left/Right
Amplifier Part Center Surround
Standby Transformer
5211
Standby Relay
1208
Mains Transformer
1008
Voltage selector
1210
Mains Socket
1209
Speaker Terminal Left/Right
1303
Speaker Terminal Surround
1356
Speaker Terminal Center
1355
CINCH Socket
1391
Surround cinch out
Matrix Surround Circuit
NTC
Clipping
STBY
+12M
+A
+5V6
+C
+B1
+B2
BC...
E
B
C
1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
POWER4 4CH stage.7 970424

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

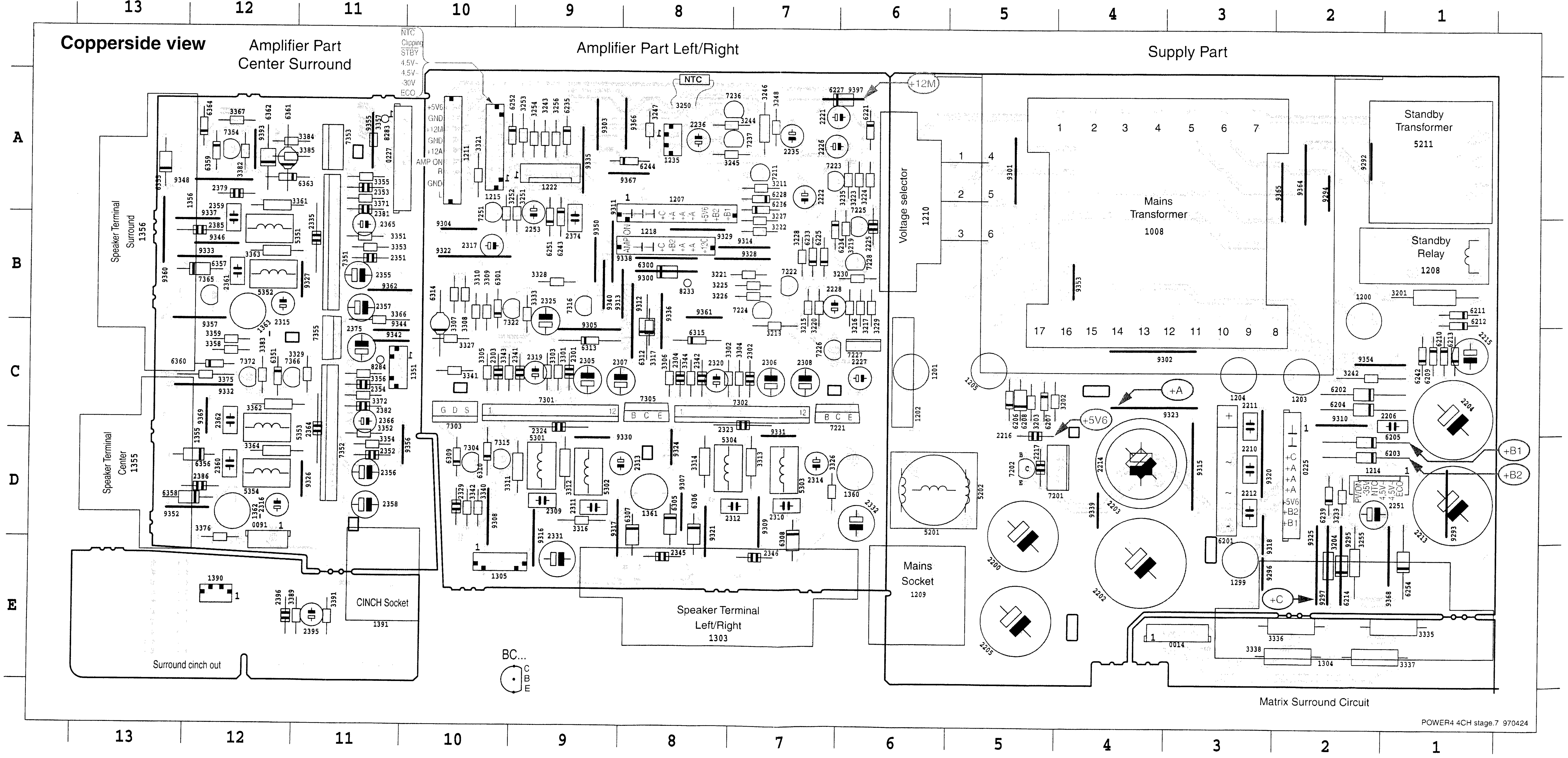
SUPPLY PART


MAINS SOCKET
1209
110-127 VAC
220-240 VAC
5202 not for /22/30/33/34
5201 for /22/30/33/34
1210
only /21
1202 only for /30/33/34
1201 not for /30/33/34
1008
not for /21
9294
1200
only for /21
9292
not for /22
3201
10M
for /37 ONLY
4,5V
10,5V
6,5V
6,5V
10,5V
38V
1205
1203
1204
18V
+C
2200
4700u
2205
4700u
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V
+B2
2213
3300u
25V
+B1
2204
3300u
100n
2212
D5SBA20
6201
2210
100n
100n
2211
36V
+A
2202
4700u
2214
2200u
2203
PROVISIONAL
0225
+C
+A
+5V6
+B2
+B1
18V
36V
5,6V
25V
25V
TO AMPLIFIER PART CONNECTOR 1207
LOW POWER STANDBY CIRCUIT
ONLY /22 version
Relay drawn active = Power on
1208
STBY-REL
18V
4V .. 6V
6213
1N4148
5211
STANDBY TRANSFORMER
6209
1N4148
6210
1N4148
6211
1N4148
6212
1N4148
+C
3R3
3204
6214
1N4002
9297
if 1299 is stuffed
9295
not for /22
6242
1N4148
2215
220u
3242
4k7
+C IN POWER ON
+C IN STANDBY
T500mA IEC
T630mA UL
1299
not on all versions
3255
1R5
6254
1N4002
-42V
2251
100u
6239
1N4148
3239
4k7
5,6V REGULATOR
7201
L7805CV
17,2V
5,6V
+5V6
3202
10k
2216
100n
BZX79-C6V8
6207
Overvoltage protection
0V
7202
BC368
6206
1N4148
6208
1N4002
3203
270
2217
100n
V
EVM
.....V DC-voltages measured with low output power
1214
4-6V
4,5V
-42V
ECO
4,5V
4,5V
NTC
-35V
PWDN
TO AMPLIFIER PART CONNECTOR 1222
Power4/4CH, 971210
CS 53 032

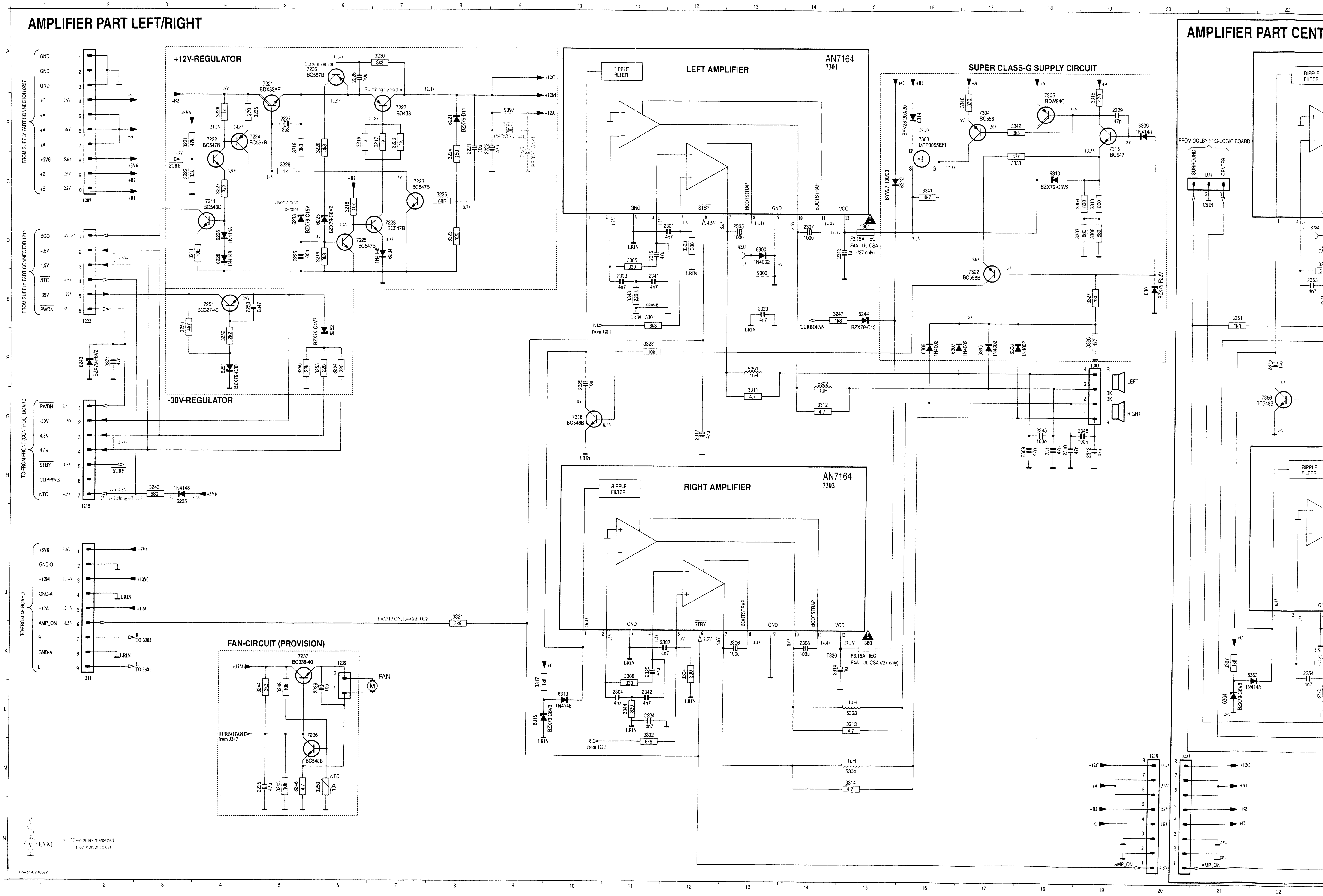
The value of the fuses depends on the specified output power.
See therefore the specification on Chapter 2.
For values of fuses see partslist on Chapter 10-10.

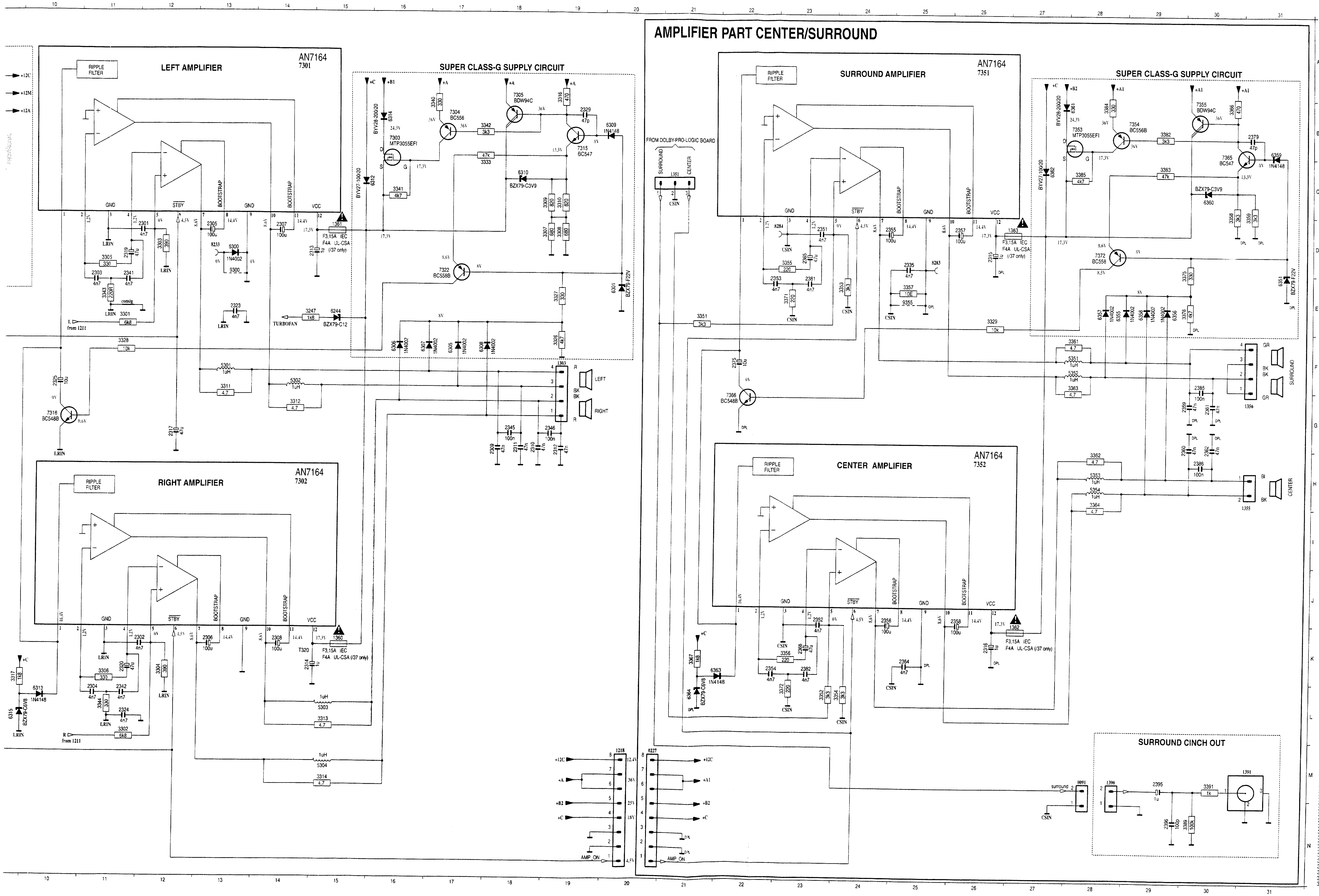
0225	A11
1008	A 4
1200	B 3
1201	A 3
1202	A 3
1203	B 6
1204	B 6
1205	A 6
1208	D 2
1209	B 1
1210	A 2
1214	I11
1299	G 4
2200	A 8
2202	D 9
2203	D 9
2204	B 9
2205	A 9
2206	C 8
2210	D 7
2211	D 8
2212	C 7
2213	B 9
2214	D 9
2215	G 2
2216	G 7
2217	H 8
2251	E 4
3201	C 1
3202	G 7
3203	H 8
3204	G 1
3239	D 5
3242	H 1
3255	D 4
5201	A 1
5202	A 1
5211	E 1
6201	C 8
6202	A 8
6203	A 8
6204	B 8
6205	B 8
6206	H 6
6207	G 8
6208	H 7
6209	F 2
6210	F 2
6211	F 2
6212	F 2
6213	E 2
6214	G 1
6239	D 5
6242	G 1
6254	D 4
7201	F 6
7202	G 9
9292	C 2
9293	B 9
9294	B 3
9295	F 4

0014	E	3
0091	E	12
0225	D	2
0227	A	11
1008	A	4
1200	B	2
1201	C	6
1202	C	6
1203	C	2
1204	C	3
1205	C	5
1207	B	8
1208	B	1
1209	E	6
1210	A	5
1211	A	10
1214	D	2
1215	A	10
1218	B	8
1222	A	9
1235	A	8
1299	E	3
1303	E	8
1304	E	2
1305	E	10
1351	C	11
1355	D	13
1356	B	13
1360	D	6
1361	D	8
1362	D	12
1363	B	12
1390	E	12
1391	E	11
2200	D	5
2202	E	4
2203	D	4
2204	C	1
2205	E	5
2206	C	1
2210	D	3
2211	C	3
2212	D	3
2213	D	1
2214	D	4
2215	C	1
2216	D	5
2217	D	5
2221	A	7
2222	A	7
2225	B	6
2226	A	7
2227	C	6
2228	B	7
2235	A	7
2236	A	8
2251	D	2
2253	A	9
2301	C	9
2302	C	7
2303	C	10
2304	C	8
2305	C	9
2306	C	7
2307	C	8
2308	C	7
2309	D	9
2310	D	7
2311	D	9
2312	D	7
2313	D	8
2314	D	7
2315	B	12
2316	D	12
2317	B	10
2319	C	9
2320	C	8
2323	C	7
2324	C	9
2325	B	9
2329	D	10
2331	E	9
2332	D	6
2335	B	11
2341	C	9
2342	C	8
2345	E	8
2346	E	7
2351	B	11
2352	D	11
2353	A	11
2354	C	11
2355	B	11
2356	D	11
2357	B	11
2358	D	11
2359	B	12
2360	D	12
2361	B	12
2362	C	12
2364	D	11
2365	B	11
2366	C	11
2374	B	9
2375	C	11
2379	A	12
2381	A	11
2382	C	11
2385	B	12
2386	D	12
2395	E	11
2396	E	12
3201	B	1
3202	C	5
3203	C	5
3204	E	2
3211	A	7
3215	B	7
3216	B	6
3217	B	6
3218	C	7
3219	B	6
3220	B	7
3221	B	7
3222	B	7
3223	A	6
3224	A	6
3225	B	7
3226	B	7
3227	B	7
3228	B	7
3229	B	6
3230	B	6
3235	A	6
3239	D	2
3242	C	2
3243	A	9
3244	A	8
3245	A	8
3246	A	7
3247	A	8
3248	A	7
3250	A	8
3251	A	9
3252	B	10
3253	A	9
3254	A	9
3255	E	2
3256	A	9
3301	C	9
3302	C	8
3303	C	9
3304	C	7
3305	C	10
3306	C	8
3307	B	10
3308	B	10
3309	B	10
3310	B	10
3311	D	9
3312	D	9
3313	D	7
3314	D	8
3316	D	9
3317	C	8
3321	A	10
3326	D	7
3327	C	10
3328	B	9
3329	C	11
3333	B	9
3335	E	1
3336	E	2
3337	E	2
3338	E	2
3340	D	10
3341	C	10
3342	D	10
3343	C	10
3344	C	8
3351	B	11
3352	D	11
3353	B	11
3354	D	11
3355	A	11
3356	C	11
3357	A	11
3358	C	12
3359	C	12
3361	A	12
3362	C	12
3363	B	12
3364	D	12
3366	B	11
3367	A	12
3371	A	11
3372	C	11
3375	C	12
3376	E	12
3382	A	12
3383	C	12
3384	A	12
3385	A	12
3389	E	11
3391	E	11
5201	D	6
5202	D	6
5211	A	1
5301	D	9
5302	D	9
5303	D	7
5304	D	8
5351	B	12
5352	B	12
5353	C	12
5354	D	12
6201	D	3
6202	C	2
6203	D	2
6204	C	2
6205	D	2
6206	C	5
6207	C	5
6208	C	5
6209	C	1
6210	C	1
6211	B	1
6212	B	1
6213	C	1
6214	E	2
6221	A	6
6225	B	7
6226	A	7
6227	A	6
6228	A	7
6233	B	7
6234	B	7
6235	A	9
6239	D	2
6242	C	1
6243	B	9
6244	A	8
6251	B	9
6252	A	10
6254	E	1
6300	B	8
6301	B	10
6305	D	8
6306	D	8
6307	D	8
6308	E	7
6309	D	10
6310	D	10
6312	C	8
6313	C	9
6314	C	10
6315	C	8
6351	C	12
6355	A	13
6356	D	12
6357	B	12
6358	D	12
6359	A	12
6360	C	12
6361	A	12
6362	A	12
6363	A	12
6364	A	12
7201	D	4
7202	D	5
7211	A	7
7221	C	7
7222	B	7
7223	A	7
7224	B	7
7225	B	6
7226	C	7
7227	C	6
7228	B	6
7236	A	7
7237	A	7
7251	A	10
7301	C	9
7302	C	7
7303	C	10
7304	D	10
7305	C	8
7315	D	10
7316	B	9
7322	B	9
7351	B	11
7352	D	11
7353	A	11
7354	A	12
7355	C	11
7365	B	12
7366	C	12
7372	C	12
8233	B	8
8283	A	11
8284	C	11
9292	A	2
9293	D	1
9294	A	2
9295	E	2
9296	E	3
9297	E	2
9300	B	8
9301	A	5
9302	C	4
9303	A	9
9304	B	10
9305	C	9
9307	D	8
9308	D	10
9309	D	7
9310	C	2
9311	B	9
9312	B	8
9313	B	8
9314	B	7
9315	D	3
9316	E	9
9317	D	9
9318	E	3
9320	D	3
9321	D	8
9322	B	10
9323	C	4
9324	D	8
9325	E	2
9326	D	11
9327	B	11
9328	B	7
9329	B	8
9330	D	9
9331	D	7
9332	C	12
9333	B	12
9335	A	9
9336	B	8
9337	B	12
9338	B	8
9339	D	4
9340	B	9
9342	C	11
9344	C	11
9346	B	12
9348	A	12
9350	B	9
9352	D	12
9353	B	4
9354	C	2
9355	A	11
9356	D	10
9357	B	12
9360	B	13
9361	B	8
9362	B	11
9364	A	2
9365	A	2
9366	A	8
9367	A	8
9368	E	1
9369	C	12
9393	A	12
9397	A	6


13
12
11
10
9
8
7
6
5
4
3
2
1
A
B
C
D
E
Copperside view
Amplifier Part
Center Surround
Amplifier Part Left/Right
Supply Part
NTC
Clipping
STBY
4.5V-
4.5V-
-30V
ECO
+5V6
GND
+12M
GND
+12A
AMP ON
+12M
Speaker Terminal
Surround
1356
Speaker Terminal
Center
1355
Surround cinch out
CINCH Socket
1391
BC...
C
B
E
Speaker Terminal
Left/Right
1303
Voltage selector
1210
Mains
Socket
1209
Mains
Transformer
1008
Standby
Transformer
5211
Standby
Relay
1208
+A
+5V6
+B1
+B2
+C
Matrix Surround Circuit
POWER4 4CH stage.7 970424

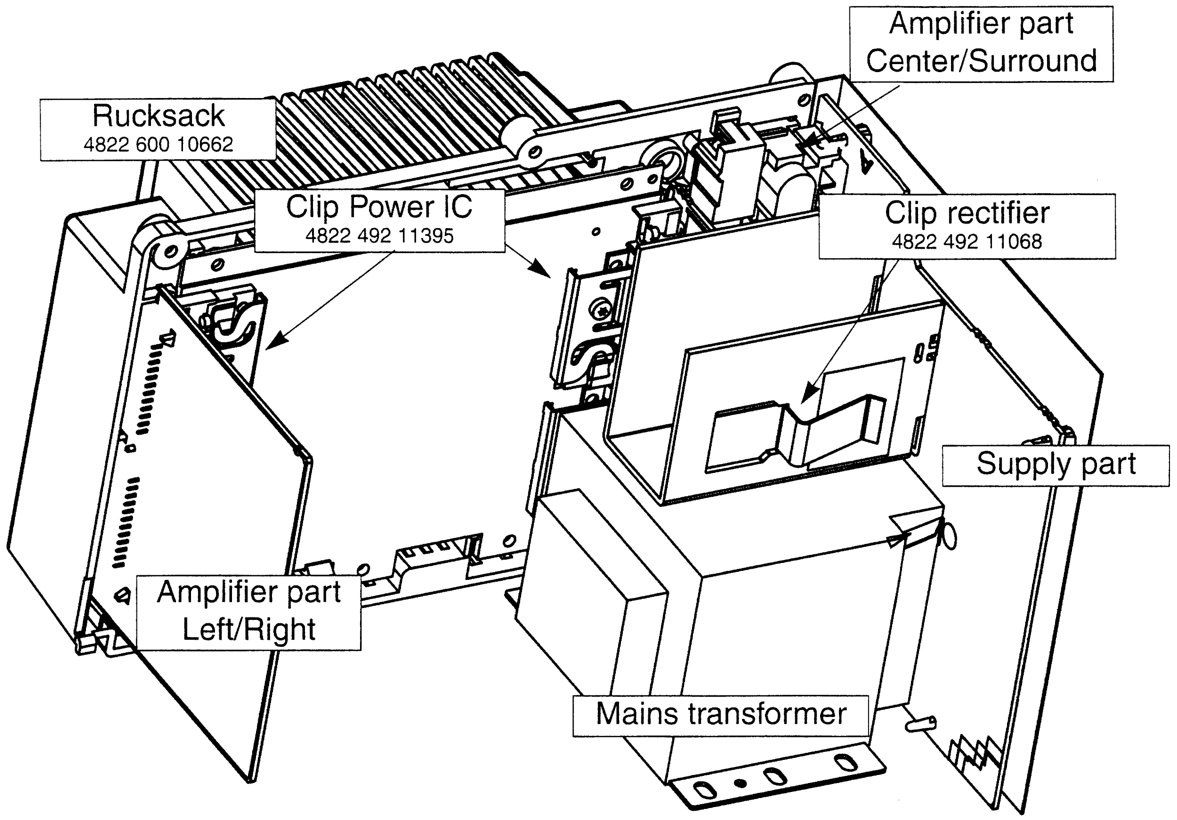
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.


AMPLIFIER PART LEFT/RIGHT
AMPLIFIER PART CENT
+12V-REGULATOR
-30V-REGULATOR
FAN-CIRCUIT (PROVISION)
LEFT AMPLIFIER
RIGHT AMPLIFIER
AN7164
7301
7302
SUPER CLASS-G SUPPLY CIRCUIT
RIPPLE FILTER
GND
STBY
BOOTSTRAP
VCC
FROM SUPPLY PART CONNECTOR 0227
FROM SUPPLY PART CONNECTOR 1214
TO/FROM FRONT (CONTROL) BOARD
TO/FROM AF-BOARD
FROM DOLBY-PRO-LOGIC BOARD
SURROUND
CENTER
CSIN
LEFT
RIGHT
FAN
TURBOFAN
H=AMP ON, L=AMP OFF
Current sensor
Switching transistor
Overvoltage sensor
PROVISIONAL
F3.15A IEC
F4A UL-CSA (/37 only)
1207
1222
1215
1211
1218
0227
1235
1303
1351
GND
+C
+A
+5V6
+B
+B1
+B2
ECO
4.5V
NTC
-35V
PWDN
-30V
STBY
CLIPPING
GND-D
+12M
GND-A
+12A
AMP_ON
R
L
+12C
LRIN
DPL
7221 BDX53AFI
7226 BC557B
7227 BD438
7222 BC547B
7224 BC557B
7211 BC548C
7223 BC547B
7228 BC547B
7225 BC547B
7251 BC327-40
7237 BC338-40
7236 BC548B
7316 BC548B
7303 MTP3055EFI
7304 BC556
7305 BDW94C
7315 BC547
7322 BC558B
7366 BC548B
V DC-voltages measured with low output power
Power 4 240397


AMPLIFIER PART CENTER/SURROUND
LEFT AMPLIFIER
AN7164
7301
RIGHT AMPLIFIER
AN7164
7302
SUPER CLASS-G SUPPLY CIRCUIT
SURROUND AMPLIFIER
AN7164
7351
CENTER AMPLIFIER
AN7164
7352
SUPER CLASS-G SUPPLY CIRCUIT
SURROUND CINCH OUT
RIPPLE FILTER
GND
STBY
BOOTSTRAP
VCC
FROM DOLBY-PRO-LOGIC BOARD
SURROUND
CENTER
TURBOFAN
LEFT
RIGHT
SURROUND
CENTER
MTP3055EFI
BC556
BDW94C
BC547
BC558B
BC548B
BZX79-C3V9
BZX79-C12
BZX79-F22V
BZX79-C6V8
1N4002
1N4148
BYV28-200/20
BYV27-100/20
F3,15A IEC
F4A UL-CSA (/37 only)
LRIN
CSIN
DPL
AMP_ON
+12C
+12M
+12A
+A
+A1
+B1
+B2
+C
L from 1211
R from 1211
surround

0091	N28
0227	N20
1207	C 1
1211	K 1
1215	I 1
1218	N20
1222	E 1
1235	K 6
1303	G19
1351	C21
1355	H30
1356	G31
1360	K15
1361	D15
1362	K27
1363	D27
1390	N28
1391	N30
2221	B 8
2222	B 8
2225	D 5
2226	B 9
2227	B 5
2228	A 6
2235	M 5
2236	L 6
2253	E 4
2301	D12
2302	K12
2303	E11
2304	L11
2305	D13
2306	K13
2307	D14
2308	K14
2309	H18
2310	H18
2311	H18
2312	H19
2313	D14
2314	K14
2315	D26
2316	K26
2317	G12
2319	D11
2320	K11
2323	D10
2324	L11
2325	F10
2329	B19
2335	D25
2341	E11
2342	L11
2345	G18
2346	G19
2351	D23
2352	J23
2353	E22
2354	K22
2355	D24
2356	J24
2357	D26
2358	J26
2359	G30
2360	G30
2361	G30
2362	G30
2364	K25
2365	D23
2366	K23
2374	F 2
2375	F22
2379	B31
2381	E23
2382	K23
2385	F30
2386	H30
2395	M29
2396	N29
3211	D 3
3215	B 5
3216	B 6
3217	B 6
3218	C 6
3219	D 5
3220	B 5
3221	B 2
3222	C 2
3223	D 7
3224	B 7
3225	B 4
3226	B 3
3227	C 3
3228	B 5
3229	B 6
3230	A 6
3235	C 7
3243	I 2
3244	L 5
3245	M 5
3246	M 5
3247	E15
3248	L 5
3250	M 6
3251	E 3
3252	F 4
3253	F 5
3254	F 5
3256	F 5
3301	E11
3302	L11
3303	D12
3304	K12
3305	D11
3306	K11
3307	D18
3308	D19
3309	C18
3310	C19
3311	G13
3312	G14
3313	L15
3314	M15
3316	B19
3317	L 9
3321	J 8
3326	F19
3327	E19
3328	F11
3329	E26
3333	C17
3340	B17
3341	C16
3342	B17
3343	E11
3344	L11
3351	E21
3352	L23
3353	E24
3354	L24
3355	D23
3356	K23
3357	E25
3358	C30
3359	C31
3361	F27
3362	H28
3363	F27
3364	H28
3366	B30
3367	K21
3371	E23
3372	L23
3375	D29
3376	E29
3382	B29
3383	C29
3384	B28
3385	C28
3389	N30
3391	M30
5301	F13
5302	F14
5303	L15
5304	M15
5351	F27
5352	F27
5353	H28
5354	H28
6221	B 7
6225	C 5
6226	D 3
6227	A 9
6228	D 3
6233	C 5
6234	D 6
6235	H 3
6243	F 1
6244	E15
6251	F 4
6252	F 5
6300	D13
6301	E20
6305	F17
6306	F16
6307	F16
6308	F17
6309	B20
6310	C18
6312	C16
6313	L10
6314	B16
6315	L 9
6351	E31
6355	E28
6356	E29
6357	E28
6358	E29
6359	B31
6360	C30
6361	B27
6362	C27
6363	K22
6364	L21
7211	C 3
7221	A 4
7222	B 3
7223	C 7
7224	B 4
7225	D 6
7226	A 5
7227	A 7
7228	C 6
7236	L 6
7237	K 5
7251	E 4
7301	A15
7302	H15
7303	B16
7304	B17
7305	B18
7315	B19
7316	G10
7322	E17
7351	A27
7352	G26
7353	B27
7354	B29
7355	B30
7365	B30
7366	G22
7372	D28
8233	D13
8283	D25
8284	D23
9300	E13
9355	E25
9397	B 9

PARTSLIST POWER4 MODULE



Please find specified output power on chapter 1-2.

Fuses for sets with 2x45W + 2x23W

1200	4822 071 51602 !	1,6A	for /21 only
1201	4822 071 51602 !	1,6A	not for /37
1201	4822 253 10126 !	T 4A	for /37 only
1202	4822 253 30447 !	T 1,6A	for /30 only
1203	4822 071 53152 !	T 3,15A	not for /37
1203	4822 253 10126 !	T 4A	for /37 only
1204	4822 071 53152 !	T 3,15A	not for /37
1204	4822 253 10126 !	T 4A	for /37 only
1205	4822 071 54002 !	T 4A	not for /37
1205	4822 071 55002 !	T 5A	for /37 only
1360	4822 252 11225 !	F 3,15A IEC 250V	not for /37
1360	4822 252 11226 !	F 4A UL/CSA 250V	for /37 only
1361	4822 252 11225 !	F 3,15A IEC 250V	not for /37
1361	4822 252 11226 !	F 4A UL/CSA 250V	for /37 only
1362	4822 252 11225 !	F 3,15A IEC 250V	not for /37
1362	4822 252 11226 !	F 4A UL/CSA 250V	for /37 only
1363	4822 252 11225 !	F 3,15A IEC 250V	not for /37
1363	4822 252 11226 !	F 4A UL/CSA 250V	for /37 only

Fuses for sets with 2x45W + 30W + 30W

1200	4822 071 51252 !	1.25A	for /21 only
1201	4822 071 51252 !	1.25A	for /21 only
1202	4822 253 30469 !	1,6A IEC	for /30 only
1203	4822 071 53152 !	RAD T 3.15A	
1204	4822 071 53152 !	RAD T 3.15A	
1205	4822 071 54002 !	T4A	
1299	4822 071 55001 !	500mA/T	
1360	4822 252 11225 !	F3.15A IEC 250V	
1361	4822 252 11225 !	F3.15A IEC 250V	
1362	4822 252 11225 !	F3.15A IEC 250V	
1363	4822 252 11225 !	F3.15A IEC 250V	

Fuses for sets with 2x40W + 25W + 25W

1200	4822 071 51002 !	T1A	for /21 only
1201	4822 071 51002 !	T1A	for /21 only
1201	4822 253 50137 !	T 2,5A UL	for /37 only
1202	4822 252 11224 !	T1A	not for /37
1203	4822 071 52502 !	T 2,5A	not for /37
1203	4822 252 51121 !	T3,15A UL	for /37 only
1204	4822 071 52502 !	T 2,5A	not for /37
1204	4822 252 51121 !	T3,15A UL	for /37 only
1205	4822 071 52502 !	T 2,5A	not for /37
1205	4822 252 51121 !	T3,15A UL	for /37 only
1299	4822 071 55001 !	500mA/T	not for /37
1299	4822 071 56301 !	T 630mA/250V	for /37 only
1360	4822 252 11225 !	F3.15A IEC 250V	not for /37
1360	4822 252 11226 !	F4A UL/CSA 250V	for /37 only
1361	4822 252 11225 !	F3.15A IEC 250V	not for /37
1361	4822 252 11226 !	F4A UL/CSA 250V	for /37 only
1362	4822 252 11225 !	F3.15A IEC 250V	not for /37
1362	4822 252 11226 !	F4A UL/CSA 250V	for /37 only
1363	4822 252 11225 !	F3.15A IEC 250V	not for /37
1363	4822 252 11226 !	F4A UL/CSA 250V	for /37 only

Fuses for sets with 2x35W + 2x18W

1200	4822 071 51252 !	1.25A	for/21only
1201	4822 071 51252 !	1.25A	for/21only
1201	4822 252 51121 !	T3,15A UL	for/37only
1202	4822 253 30475 !	1,25A IEC	for/30only
1203	4822 071 53152 !	RAD T 3.15A	for/22 and /30 only
1203	4822 253 10126 !	T4A UL	for/37only
1204	4822 071 53152 !	RAD T 3.15A	not for /37
1204	4822 253 10126 !	T4A UL	for/37only
1205	4822 071 54002 !	T4A	not for /37
1205	4822 071 55002 !	T5A	for/37only
1360	4822 252 11225 !	F3.15A IEC 250V	not for /37
1360	4822 252 11226 !	F4A UL/CSA 250V	for/37only
1361	4822 252 11225 !	F3.15A IEC 250V	not for /37
1361	4822 252 11226 !	F4A UL/CSA 250V	for/37only
1362	4822 252 11225 !	F3.15A IEC 250V	not for /37
1362	4822 252 11226 !	F4A UL/CSA 250V	for/37only
1363	4822 252 11225 !	F3.15A IEC 250V	not for /37
1363	4822 252 11226 !	F4A UL/CSA 250V	for/37only

ELECTRICAL PARTSLIST POWER4 MODULE

MISCELLANEOUS

	4822 255 40179	SPRING CLIP TO220	
1008	MAINS TRANSFORMER see partslist of set		
1208	4822 280 80777 !	RELAY	for /22 only
1209	4822 265 31015 !	MAINS SOCKET	not for /37
1209	4822 265 31016 !	MAINS SOCKET	for /37 only
1210	4822 272 10269 !	VOLTAGE SELECTOR	for /21 only
1303	4822 267 31176	SPEAKER TERMINAL	
1355	4822 265 10464	SPEAKER TERMINAL 2P	
1356	4822 265 10912	SPEAKER TERMINAL 4P	
1391	4822 265 10913	CINCH SOCKET 1P	
5211	4822 146 10756 !	TRANSFORMER STANDBY	for /22 only

CAPACITORS

2200	4822 124 80103	4700µF	20%	25V
2202	4822 124 80415	4700µF	20%	50V
2204	4822 124 42367	3300µF	20%	35V
2205	4822 124 80103	4700µF	20%	25V
2206	5322 121 42386	100nF	5%	63V
2210	5322 121 42386	100nF	5%	63V
2211	5322 121 42386	100nF	5%	63V
2212	5322 121 42386	100nF	5%	63V
2213	4822 124 42367	3300µF	20%	35V
2214	4822 124 11956	2200µF	20%	50V
2215	4822 124 22263	220µF	20%	25V
2216	4822 126 12882	100nF	20%	50V
2221	4822 124 41579	10µF	20%	50V
2222	4822 124 40433	47µF	20%	25V
2227	4822 124 41576	2,2µF	20%	50V
2228	4822 124 41579	10µF	20%	50V
2251	4822 124 40255	100µF	20%	50V
2253	4822 124 41407	0,47µF	20%	63V
2301	4822 126 11714	4,7nF	20%	16V
2302	4822 126 11714	4,7nF	20%	16V
2303	4822 126 11714	4,7nF	20%	16V
2304	4822 126 11714	4,7nF	20%	16V
2305	4822 124 81029	100µF	20%	25V
2306	4822 124 81029	100µF	20%	25V
2307	4822 124 81029	100µF	20%	25V
2308	4822 124 81029	100µF	20%	25V
2309	4822 121 43526	47nF	5%	100V
2310	4822 121 43526	47nF	5%	100V
2311	4822 121 43526	47nF	5%	100V
2312	4822 121 43526	47nF	5%	100V
2313	4822 124 40242	1µF	20%	63V
2314	4822 124 40242	1µF	20%	63V
2315	4822 124 40242	1µF	20%	63V
2316	4822 124 40242	1µF	20%	63V
2317	4822 124 40433	47µF	20%	25V

CAPACITORS

2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2323	4822 126 11714	4,7nF	20%	16V
2324	4822 126 11714	4,7nF	20%	16V
2325	4822 124 41579	10µF	20%	50V
2329	4822 122 33848	47pF	5%	50V
2335	4822 126 11714	4,7nF	20%	16V
2341	4822 126 11714	4,7nF	20%	16V
2342	4822 126 11714	4,7nF	20%	16V
2345	4822 126 12882	100nF	20%	50V
2346	4822 126 12882	100nF	20%	50V
2351	4822 126 11714	4,7nF	20%	16V
2352	4822 126 11714	4,7nF	20%	16V
2353	4822 126 11714	4,7nF	20%	16V
2354	4822 126 11714	4,7nF	20%	16V
2355	4822 124 81029	100µF	20%	25V
2356	4822 124 81029	100µF	20%	25V
2357	4822 124 81029	100µF	20%	25V
2358	4822 124 81029	100µF	20%	25V
2359	4822 121 43526	47nF	5%	100V
2360	4822 121 43526	47nF	5%	100V
2361	4822 121 43526	47nF	5%	100V
2362	4822 121 43526	47nF	5%	100V
2364	4822 126 11714	4,7nF	20%	16V
2365	4822 124 40433	47µF	20%	25V
2366	4822 124 40433	47µF	20%	25V
2374	4822 121 43526	47nF	5%	100V
2375	4822 124 41579	10µF	20%	50V
2379	4822 122 33848	47pF	5%	50V
2381	4822 126 11714	4,7nF	20%	16V
2382	4822 126 11714	4,7nF	20%	16V
2385	4822 126 12882	100nF	20%	50V
2386	4822 126 12882	100nF	20%	50V
2395	4822 124 41969	1µF	20%	50V
2396	4822 122 33195	100pF	10%	50V

RESISTORS

3201	4822 053 21106 !	10MΩ	5%	0,5W
3202	4822 116 83864	10kΩ	5%	0,5W
3203	4822 116 83876	270Ω	5%	0.16W
3204	4822 052 10338 !	3,3Ω		NFR25
3211	4822 116 52176	10Ω	5%	0,5W
3215	4822 116 52269	3,3kΩ	5%	0,5W
3216	4822 050 11002	1kΩ	5%	0,2W
3217	4822 050 11002	1kΩ	5%	0,2W
3218	4822 116 83864	10kΩ	5%	0,5W
3219	4822 116 52269	3,3kΩ	5%	0,5W
3223	4822 116 52206	120Ω	5%	0,5W
3224	4822 116 83868	150Ω	5%	0,5W
3225	4822 116 83876	270Ω	5%	0.16W

ELECTRICAL PART

RESISTORS

3220	4822 116 52
3221	4822 116 83
3222	4822 116 52
3223	4822 116 52
3224	4822 116 83
3225	4822 116 83
3226	4822 050 11
3226	4822 050 11
3227	4822 116 52
3228	4822 050 11
3229	4822 050 11
3230	4822 116 52
3235	4822 116 52
3239	4822 116 52
3242	4822 116 52
3243	4822 116 52
3251	4822 116 52
3252	4822 116 52
3253	4822 116 83
3254	4822 116 83
3255	4822 117 12
3256	4822 116 52
3301	4822 116 83
3302	4822 116 83
3303	4822 116 83
3304	4822 116 83
3305	4822 116 52
3306	4822 116 52
3307	4822 116 52
3308	4822 116 52
3309	4822 116 52
3310	4822 116 52
3311	4822 050 24
3312	4822 050 24
3313	4822 050 24
3314	4822 050 24
3316	4822 116 83
3317	4822 116 52
3321	4822 116 52
3326	4822 116 52
3327	4822 116 52
3328	4822 116 83
3329	4822 116 83
3333	4822 116 83
3340	4822 116 52
3341	4822 116 52
3342	4822 116 52
3343	4822 116 83
3344	4822 116 83
3351	4822 116 52
3352	4822 116 52
3353	4822 116 52
3354	4822 116 52
3355	4822 116 83
3356	4822 116 83
3357	4822 116 521
3358	4822 116 52
3359	4822 116 52
3361	4822 050 247
3362	4822 050 247

Fuses for sets with 2x35W + 2x18W

1200	4822 071 51252	!	1.25A for/21only
1201	4822 071 51252	!	1.25A for/21only
1201	4822 252 51121	!	T3,15A UL.............................for/37only
1202	4822 253 30475	!	1,25A IEC for/30only
1203	4822 071 53152	!	RAD T 3.15A...........for/22 and /30 only
1203	4822 253 10126	!	T4A UL..................................for/37only
1204	4822 071 53152	!	RAD T 3.15A ....not for /37
1204	4822 253 10126	!	T4A UL..................................for/37only
1205	4822 071 54002	!	T4A.......................................not for /37
1205	4822 071 55002	!	T5A for/37only

1360	4822 252 11225	!	F3.15A IEC 250V ....not for /37
1360	4822 252 11226	!	F4A UL/CSA 250V.................for/37only
1361	4822 252 11225	!	F3.15A IEC 250V ....not for /37
1361	4822 252 11226	!	F4A UL/CSA 250V.................for/37only
1362	4822 252 11225	!	F3.15A IEC 250V ....not for /37
1362	4822 252 11226	!	F4A UL/CSA 250V.................for/37only
1363	4822 252 11225	!	F3.15A IEC 250V ....not for /37
1363	4822 252 11226	!	F4A UL/CSA 250V.................for/37only

ELECTRICAL PARTSLIST POWER4 MODULE

MISCELLANEOUS

	4822 255 40179		SPRING CLIP TO220
1008	MAINS TRANSFORMER see partslist of set		
1208	4822 280 80777	!	RELAY ....for /22 only
1209	4822 265 31015	!	MAINS SOCKET ....not for /37
1209	4822 265 31016	!	MAINS SOCKET..................for /37 only
1210	4822 272 10269	!	VOLTAGE SELECTOR ....for /21 only
1303	4822 267 31176		SPEAKER TERMINAL
1355	4822 265 10464		SPEAKER TERMINAL 2P
1356	4822 265 10912		SPEAKER TERMINAL 4P
1391	4822 265 10913		CINCH SOCKET 1P
5211	4822 146 10756	!	TRANSFORMER STANDBY...for /22 only

CAPACITORS

2200	4822 124 80103	4700µF	20%	25V
2202	4822 124 80415	4700µF	20%	50V
2204	4822 124 42367	3300µF	20%	35V
2205	4822 124 80103	4700µF	20%	25V
2206	5322 121 42386	100nF	5%	63V
2210	5322 121 42386	100nF	5%	63V
2211	5322 121 42386	100nF	5%	63V
2212	5322 121 42386	100nF	5%	63V
2213	4822 124 42367	3300µF	20%	35V
2214	4822 124 11956	2200µF	20%	50V
2215	4822 124 22263	220µF	20%	25V
2216	4822 126 12882	100nF	20%	50V
2221	4822 124 41579	10µF	20%	50V
2222	4822 124 40433	47µF	20%	25V
2227	4822 124 41576	2,2µF	20%	50V
2228	4822 124 41579	10µF	20%	50V
2251	4822 124 40255	100µF	20%	50V
2253	4822 124 41407	0,47µF	20%	63V
2301	4822 126 11714	4,7nF	20%	16V
2302	4822 126 11714	4,7nF	20%	16V
2303	4822 126 11714	4,7nF	20%	16V
2304	4822 126 11714	4,7nF	20%	16V
2305	4822 124 81029	100µF	20%	25V
2306	4822 124 81029	100µF	20%	25V
2307	4822 124 81029	100µF	20%	25V
2308	4822 124 81029	100µF	20%	25V
2309	4822 121 43526	47nF	5%	100V
2310	4822 121 43526	47nF	5%	100V
2311	4822 121 43526	47nF	5%	100V
2312	4822 121 43526	47nF	5%	100V
2313	4822 124 40242	1µF	20%	63V
2314	4822 124 40242	1µF	20%	63V
2315	4822 124 40242	1µF	20%	63V
2316	4822 124 40242	1µF	20%	63V
2317	4822 124 40433	47µF	20%	25V

CAPACITORS

2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2323	4822 126 11714	4,7nF	20%	16V
2324	4822 126 11714	4,7nF	20%	16V
2325	4822 124 41579	10µF	20%	50V
2329	4822 122 33848	47pF	5%	50V
2335	4822 126 11714	4,7nF	20%	16V
2341	4822 126 11714	4,7nF	20%	16V
2342	4822 126 11714	4,7nF	20%	16V
2345	4822 126 12882	100nF	20%	50V
2346	4822 126 12882	100nF	20%	50V
2351	4822 126 11714	4,7nF	20%	16V
2352	4822 126 11714	4,7nF	20%	16V
2353	4822 126 11714	4,7nF	20%	16V
2354	4822 126 11714	4,7nF	20%	16V
2355	4822 124 81029	100µF	20%	25V
2356	4822 124 81029	100µF	20%	25V
2357	4822 124 81029	100µF	20%	25V
2358	4822 124 81029	100µF	20%	25V
2359	4822 121 43526	47nF	5%	100V
2360	4822 121 43526	47nF	5%	100V
2361	4822 121 43526	47nF	5%	100V
2362	4822 121 43526	47nF	5%	100V
2364	4822 126 11714	4,7nF	20%	16V
2365	4822 124 40433	47µF	20%	25V
2366	4822 124 40433	47µF	20%	25V
2374	4822 121 43526	47nF	5%	100V
2375	4822 124 41579	10µF	20%	50V
2379	4822 122 33848	47pF	5%	50V
2381	4822 126 11714	4,7nF	20%	16V
2382	4822 126 11714	4,7nF	20%	16V
2385	4822 126 12882	100nF	20%	50V
2386	4822 126 12882	100nF	20%	50V
2395	4822 124 41969	1µF	20%	50V
2396	4822 122 33195	100pF	10%	50V

RESISTORS

3201	4822 053 21106 !	10MΩ	5%	0,5W
3202	4822 116 83864	10kΩ	5%	0,5W
3203	4822 116 83876	270Ω	5%	0.16W
3204	4822 052 10338 !	3,3Ω		NFR25
3211	4822 116 52176	10Ω	5%	0,5W
3215	4822 116 52269	3,3kΩ	5%	0,5W
3216	4822 050 11002	1kΩ	5%	0,2W
3217	4822 050 11002	1kΩ	5%	0,2W
3218	4822 116 83864	10kΩ	5%	0,5W
3219	4822 116 52269	3,3kΩ	5%	0,5W
3223	4822 116 52206	120Ω	5%	0,5W
3224	4822 116 83868	150Ω	5%	0,5W
3225	4822 116 83876	270Ω	5%	0.16W

ELECTRICAL PARTSLIST POWER4 MODULE

RESISTORS

3220	4822 116 52269	3,3kΩ	5%	0,5W
3221	4822 116 83884	47kΩ	5%	0,16W
3222	4822 116 52271	33kΩ	5%	0,16W
3223	4822 116 52206	120Ω	5%	0,5W
3224	4822 116 83868	150Ω	5%	0,5W
3225	4822 116 83876	270Ω	5%	0.16W
3226	4822 050 11002	1kΩ	5%	0,2W
3226	4822 050 11002	1kΩ	5%	0,2W
3227	4822 116 52256	2,2kΩ	5%	0,16W
3228	4822 050 11002	1kΩ	5%	0,2W
3229	4822 050 11002	1kΩ	5%	0,2W
3230	4822 116 52269	3,3kΩ	5%	0,5W
3235	4822 116 52199	68Ω	5%	0,16W
3239	4822 116 52283	4,7kΩ	5%	0,5W
3242	4822 116 52283	4,7kΩ	5%	0,5W
3243	4822 116 52228	680Ω	5%	0,5W
3251	4822 116 52283	4,7kΩ	5%	0,5W
3252	4822 116 52256	2,2kΩ	5%	0,16W
3253	4822 116 83872	220Ω	5%	0,5W
3254	4822 116 83872	220Ω	5%	0,5W
3255	4822 117 12148 !	1,5Ω	5%	NFR
3256	4822 116 52257	22kΩ	5%	0,5W
3301	4822 116 83961	6,8kΩ	5%	0,16W
3302	4822 116 83961	6,8kΩ	5%	0,16W
3303	4822 116 83881	390Ω	5%	0,5W
3304	4822 116 83881	390Ω	5%	0,5W
3305	4822 116 52219	330Ω	5%	0,5W
3306	4822 116 52219	330Ω	5%	0,5W
3307	4822 116 52228	680Ω	5%	0,5W
3308	4822 116 52228	680Ω	5%	0,5W
3309	4822 116 52231	820Ω	5%	0,5W
3310	4822 116 52231	820Ω	5%	0,5W
3311	4822 050 24708	4,7Ω	1%	0,6W
3312	4822 050 24708	4,7Ω	1%	0,6W
3313	4822 050 24708	4,7Ω	1%	0,6W
3314	4822 050 24708	4,7Ω	1%	0,6W
3316	4822 116 83883	470Ω	5%	0,16W
3317	4822 116 52249	1,8kΩ	5%	0,16W
3321	4822 116 52276	3,9kΩ	5%	0,5W
3326	4822 116 52283	4,7kΩ	5%	0,5W
3327	4822 116 52219	330Ω	5%	0,5W
3328	4822 116 83864	10kΩ	5%	0,5W
3329	4822 116 83864	10kΩ	5%	0,5W
3333	4822 116 83884	47kΩ	5%	0,16W
3340	4822 116 52219	330Ω	5%	0,5W
3341	4822 116 52283	4,7kΩ	5%	0,5W
3342	4822 116 52269	3,3kΩ	5%	0,5W
3343	4822 116 83872	220Ω	5%	0,5W
3344	4822 116 83872	220Ω	5%	0,5W
3351	4822 116 52269	3,3kΩ	5%	0,5W
3352	4822 116 52269	3,3kΩ	5%	0,5W
3353	4822 116 52269	3,3kΩ	5%	0,5W
3354	4822 116 52269	3,3kΩ	5%	0,5W
3355	4822 116 83872	220Ω	5%	0,5W
3356	4822 116 83872	220Ω	5%	0,5W
3357	4822 116 52176	10Ω	5%	0,5W
3358	4822 116 52269	3,3kΩ	5%	0,5W
3359	4822 116 52269	3,3kΩ	5%	0,5W
3361	4822 050 24708	4,7Ω	1%	0,6W
3362	4822 050 24708	4,7Ω	1%	0,6W

RESISTORS

3363	4822 050 24708	4,7Ω	1%	0,6W
3364	4822 050 24708	4,7Ω	1%	0,6W
3366	4822 116 83883	470Ω	5%	0,16W
3367	4822 116 52249	1,8kΩ	5%	0,16W
3371	4822 116 83872	220Ω	5%	0,5W
3372	4822 116 83872	220Ω	5%	0,5W
3375	4822 116 52219	330Ω	5%	0,5W
3376	4822 116 52283	4,7kΩ	5%	0,5W
3382	4822 116 52269	3,3kΩ	5%	0,5W
3383	4822 116 83884	47kΩ	5%	0,16W
3384	4822 116 52219	330Ω	5%	0,5W
3385	4822 116 52283	4,7kΩ	5%	0,5W
3389	4822 116 52234	100kΩ	5%	0,5W
3391	4822 050 11002	1kΩ	5%	0,2W

COILS

5201	4822 157 71285	400µH
5202	4822 157 10417	MAINS FILTER
5301	4822 157 62255	COIL 18,5 TURNS
5302	4822 157 62255	COIL 18,5 TURNS
5303	4822 157 62255	COIL 18,5 TURNS
5304	4822 157 62255	COIL 18,5 TURNS
5351	4822 157 62255	COIL 18,5 TURNS
5352	4822 157 62255	COIL 18,5 TURNS
5353	4822 157 62255	COIL 18,5 TURNS
5354	4822 157 62255	COIL 18,5 TURNS

DIODES

6201	4822 130 82078	!	D5SBA20
6202	5322 130 80686	!	1N5392
6203	5322 130 80686	!	1N5392
6204	5322 130 80686	!	1N5392
6205	5322 130 80686	!	1N5392
6206	4822 130 30621		1N4148
6207	4822 130 34278		BZX79-C6V8
6208	5322 130 30684		1N4002
6209	4822 130 30621		1N4148
6210	4822 130 30621		1N4148
6211	4822 130 30621		1N4148
6212	4822 130 30621		1N4148
6213	4822 130 30621		1N4148
6214	5322 130 30684		1N4002
6221	4822 130 34488		BZX79-C11
6225	4822 130 34382		BZX79-C8V2
6226	4822 130 30621		1N4148
6228	4822 130 30621		1N4148
6233	4822 130 34281		BZX79-C15
6234	4822 130 30621		1N4148
6235	4822 130 30621		1N4148
6239	4822 130 30621		1N4148
6242	4822 130 30621		1N4148
6243	4822 130 34382		BZX79-C8V2
6251	4822 130 34328		BZX79-C30
6252	4822 130 34173		BZX79-B5V6
6252	4822 130 34174		BZX79-B4V7
6254	5322 130 30684		1N4002
6300	5322 130 30684		1N4002
6301	4822 130 34441		BZX79-F22
6305	5322 130 30684		1N4002
6306	5322 130 30684		1N4002
6307	5322 130 30684		1N4002
6308	5322 130 30684		1N4002
6309	4822 130 30621		1N4148

ELECTRICAL PARTSLIST POWER4 MODULE

DIODES

6310	4822 130 31981	BZX79-C3V9
6312	4822 130 31982	BYV27-100
6313	4822 130 30621	1N4148
6314	4822 130 80791	BYV28-200/20
6315	4822 130 34278	BZX79-C6V8
6351	4822 130 34441	BZX79-F22
6355	5322 130 30684	1N4002
6356	5322 130 30684	1N4002
6357	5322 130 30684	1N4002
6358	5322 130 30684	1N4002
6359	4822 130 30621	1N4148
6360	4822 130 31981	BZX79-C3V9
6361	4822 130 80791	BYV28-200/20
6362	4822 130 31982	BYV27-100
6363	4822 130 30621	1N4148
6364	4822 130 34278	BZX79-C6V8

TRANSISTORS

7202	5322 130 44647	BC368
7211	4822 130 44196	BC548C
7221	4822 130 10812	BDX53BFI
7222	4822 130 40959	BC547B
7223	4822 130 40959	BC547B

AF5 BOARD

TABLE OF CONTENTS

Brief Introduction of the AF5 Board & Variation table ... 12-1
Component and Chip layouts 12-2
Circuit Diagram 12-3
Electrical parts list... 12-4

BRIEF INTRODUCTION OF THE AF5 BOARD

The AF5 Board consists of the following features :

a. SOFAC IC

SOFAC IC TEA6321 (7553) which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C data from the microprocessor.

The SOFAC IC caters for 4 input sources, namely tuner, tape, CD and AUX. It also has a MONO input which is tied to ground via 100n. In our application , software will switch the input source to MONO input during STANDBY mode and some other occasions where noise from other input sources is undesirable.

Note that the input to the SOFAC IC must be ac coupled to prevent 'plop' noise. Input networks are included to provide appropriate attenuation for various sources.

b. KARAOKE MIC. MIXING

Karaoke Mic. Mixing can be configured to cater for one of the following :
NK : Non Karaoke.
SK : Simple Karaoke which caters for mic. mixing with additional mic. amplifier board.
FK : Full Karaoke with vocal fader and echo effect with additional karaoke board.

c. DOLBY PRO LOGIC (DPL) INTERFACE

DPL Interface can be configured to cater for DPL and also DPL with one of the karaoke functions.

d. LINE OUT

Line Out with JST XH connector for connection to LINE OUT cinch socket.

e. SUB-WOOFER OUTPUT

Sub-Woofer Output with cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND

Incredible Surround effect using transistor circuit BC847C (7517, 7518, 7519, 7520) to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER

Headphone Amplifier using Op-Amp. NJM4556AM (7501).

h. CD STANDBY SWITCH

CD Standby control circuit using transistors BC327-25 (7515) and BC847C (7516) which switches on the supply to CD servo control IC , HF circuit and the laser light pen in CD mode only.

i. HEADPHONE SENSING CIRCUIT

Headphone Sensing circuit to mute centre and surround channels in DPL application.

j. ATTENUATION NETWORK

Attenuation network is provided at the output of the AF5 Board for interfacing with the power board of different output power.

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AF5 Boards application

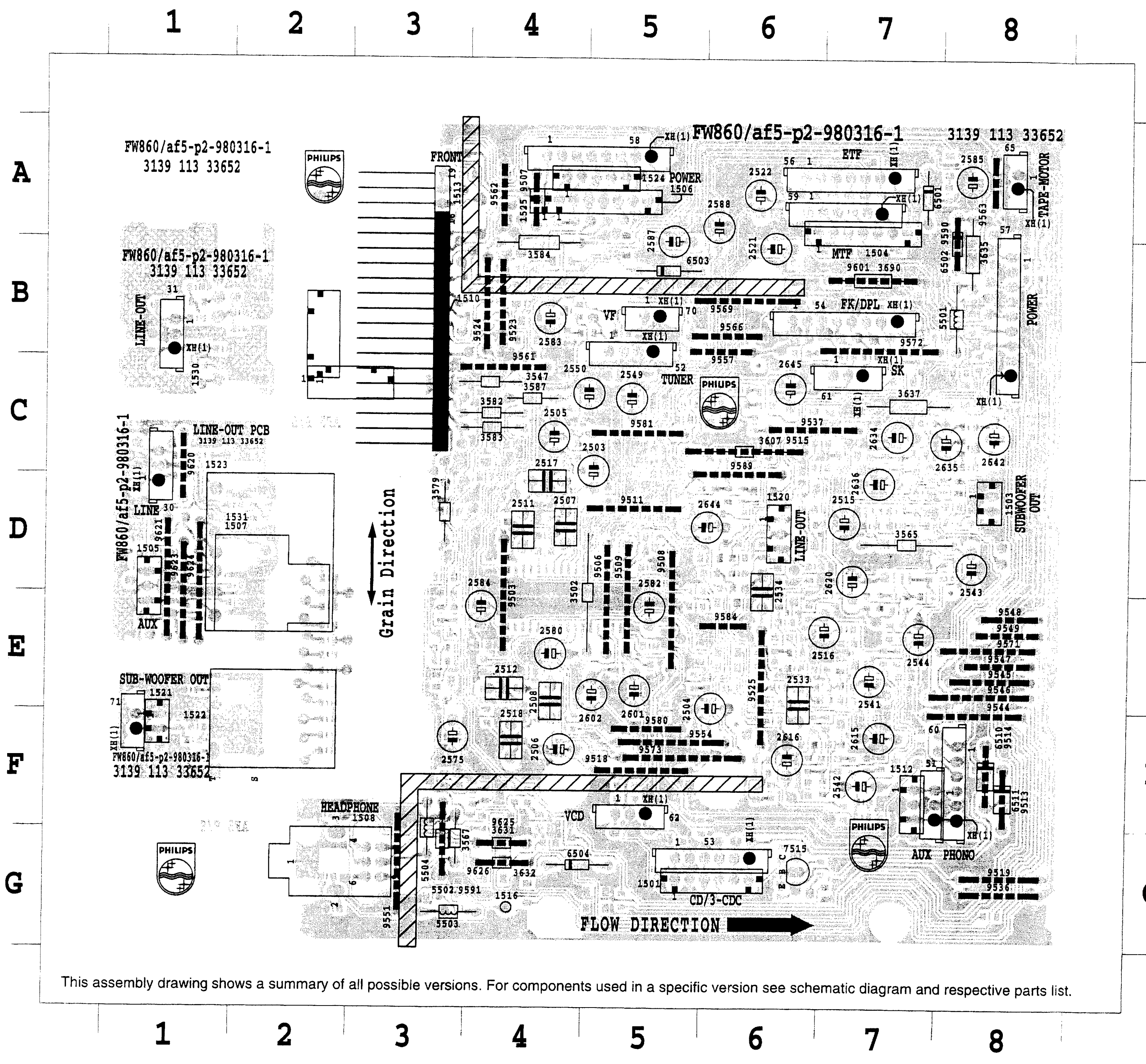
A50170	FW530C/21/21M , FW535C/21/21M , FW570C/21/21M/33 , FW575C/21/21M/33 , FW538/21
A50180	FW530C/22/34/37 , FW535C/22/30/34 , FW550C/22 , FW570C/22/37 , FW538/22/34
A50330	FW755P/30/37
A50340	FW754P/37
A50400	FW775P/22/30/37
A50430	FW765P/22/34 , FW795W/22/37
A50450	FW765P/21/21M/33
A50470	FW520C/37
A50510	FW560C/37
A51020	FW72/37

Variations table for AF5 Board

	A50170	A50180	A50330	A50340	A50400	A50430	A50450	A50470	A50510	A51020
DM30	x	x	x	x	-	x	x	-	-	-
DM31	-	-	-	-	x	-	-	-	x	-
DM54,1517	-	-	x	x	x	x	x	-	-	-
DM56	x	x	-	-	x	x	x	-	-	x
DM59	-	-	x	x	-	-	-	x	x	-
DM61,1577	x	-	-	-	-	-	x	-	-	-
1506	x	x	x	x	-	x	x	x	-	x
1507	-	-	-	-	-	-	-	x	-	x
1510	x	x	x	x	-	x	x	x	-	x
1513	-	-	-	-	x	-	-	-	x	-
1523	x	x	x	x	-	x	x	-	-	-
1525	-	-	-	-	x	-	-	-	x	-
1530,1531	-	-	-	-	x	-	-	-	x	-
1579	7P	7P	6P	6P	7P	7P	7P	6P	6P	7P
2521,2522	4.7μF	4.7μF	0.47μF	0.47μF	4.7μF	4.7μF	4.7μF	0.47μF	0.47μF	4.7μF
2541,2542	47μF	47μF	47μF	47μF	47μF	47μF	47μF	1μF	47μF	1μF
2585	47μF	47μF	-	-	47μF	47μF	47μF	-	-	47μF
2586	-	-	-	-	100nF	-	-	100nF	100nF	100nF
2603	-	-	100pF	100pF	100pF	100pF	100pF	-	-	-
2643	-	-	1μF	1μF	1μF	1μF	1μF	-	-	-
2652,2653	22nF	22nF	22nF	22nF	-	22nF	22nF	-	-	-
3501,3502	100R	100R	100R	100R	10k	100R	100R	100R	10k	100R
3519,3520	-	-	6k8	6k8	6k8	6k8	6k8	-	-	-
3521,3522	15k	-	-	-	-	-	15k	-	-	-
3523,3524	8k2	8k2	47k	47k	8k2	8k2	8k2	47k	47k	8k2
3525,3526	3k3	3k3	39k	39k	3k3	3k3	3k3	39k	39k	3k3
3529	-	-	5k6	5k6	5k6	5k6	5k6	-	-	-
3530	-	-	15k	15k	15k	15k	15k	-	-	-
3563,3564	150k	150k	100k	100k	100k	100k	100k	100k	100k	100k
3577,3578	4k7	4k7	4k7	-	4k7	4k7	4k7	-	-	-
3589	5k6	5k6	-	-	5k6	5k6	5k6	-	-	5k6
3597,3598	-	-	27k	27k	27k	27k	27k	-	-	-
3605,3606	1k5	-	2k2	2k2	2k2	2k2	2k2	-	-	-
3645,3646	-	-	1k8	1k8	1k8	1k8	1k8	-	-	-
3647,3648	100R	100R	100R	100R	100R	100R	100R	4k7	100R	4k7
3661,3662	5k6	-	-	-	-	-	-	-	-	-
3674	8k2	8k2	15k	15k	15k	15k	15k	8k2	8k2	8k2
3675	2k2	3k3	6k8	4k7	8k2	3k3	2k2	6k8	8k2	15k
4501,4502	-	x	-	-	-	-	-	x	x	x
4525,4580	x	-	-	-	-	-	x	-	-	-
4527	-	-	x	x	x	x	x	-	-	-
4572	x	-	x	x	x	x	x	-	-	-
4573	-	x	x	x	x	x	x	x	x	-
4600,4602	-	-	-	-	x	-	-	-	x	-
4611,4612	x	-	x	x	x	x	x	-	-	-
4623	-	x	x	x	x	x	x	x	x	-
6501	x	x	-	-	x	x	x	-	-	x
9507	x	x	x	-	-	x	x	x	-	x
9589	x	x	x	x	x	x	x	-	x	-
9623,9624	-	-	-	-	x	-	-	-	x	-

x = Item in use.

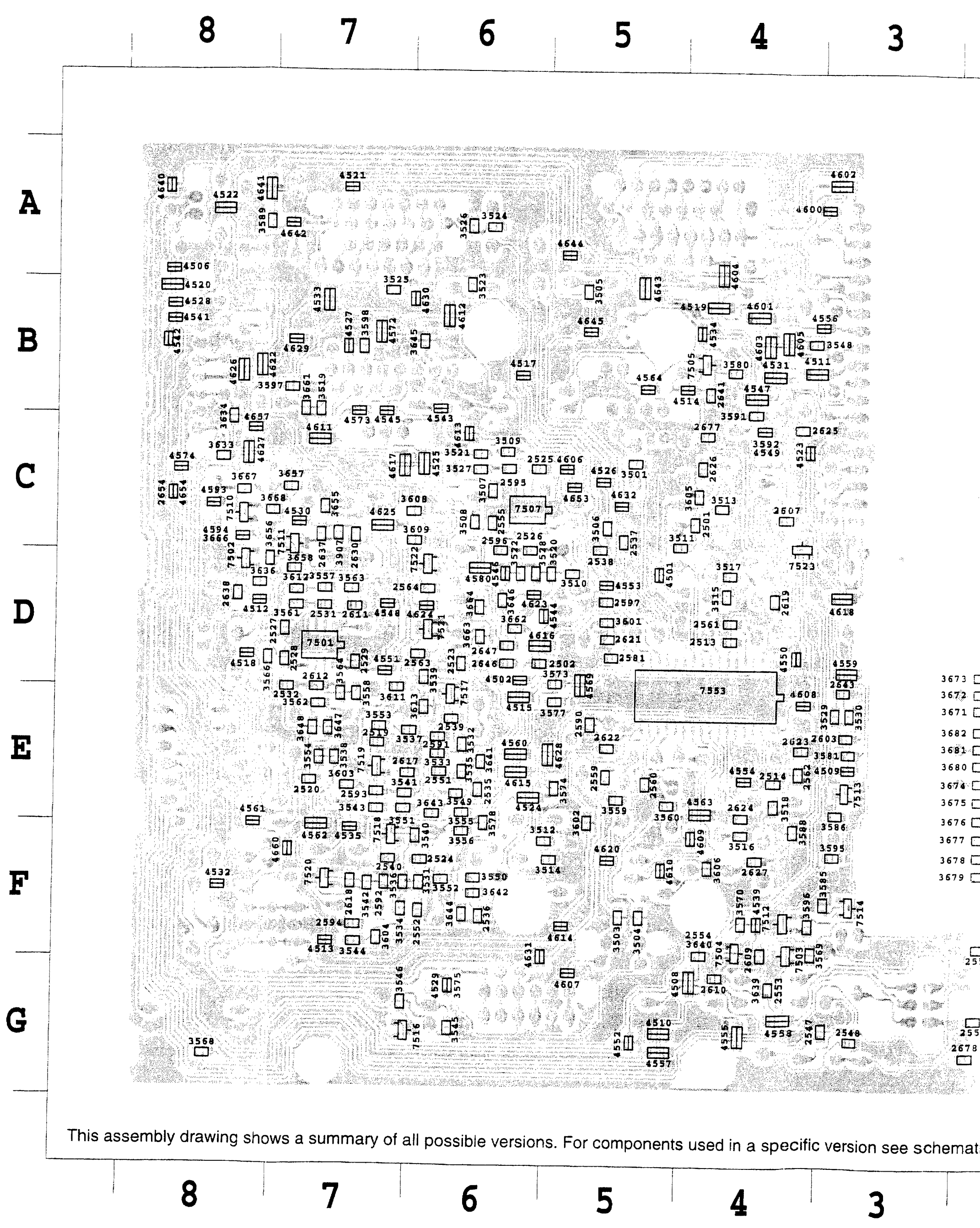
COMPONENT LAYOUT


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
FW860/af5-p2-980316-1
3139 113 33652
FRONT
POWER
ETF
TAPE-MOTOR
MTF
FK/DPL
SK
VF
TUNER
LINE-OUT
LINE-OUT PCB
LINE
AUX
SUB-WOOFER OUT
SUBWOOFER OUT
HEADPHONE
VCD
CD/3-CDC
AUX PHONO
Grain Direction
FLOW DIRECTION

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

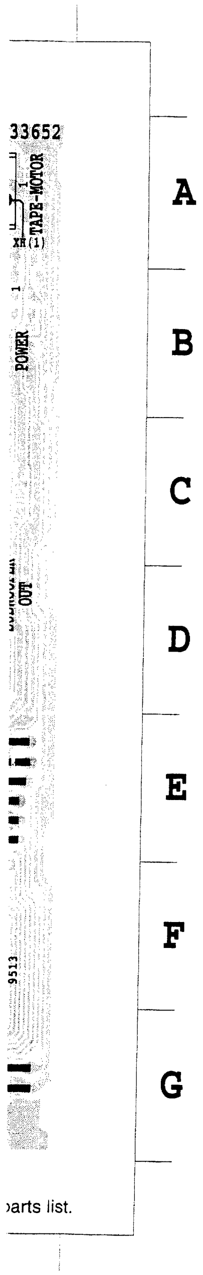
30	C	1
31	B	1
51	F	7
52	B	5
53	G	6
54	B	7
56	A	7
57	B	8
58	A	5
59	A	7
60	F	8
61	C	7
62	F	5
65	A	8
70	B	5
71	F	1
1501	G	6
1503	D	8
1504	A	7
1505	D	1
1506	A	5
1507	E	2
1508	G	2
1510	B	3
1512	F	7
1513	B	3
1516	G	4
1520	D	6
1521	F	1
1522	F	2
1523	D	2
1524	A	5
1525	A	5
1530	B	2
1531	C	2
2503	C	5
2504	E	6
2505	C	4
2506	F	4
2507	D	4
2508	E	4
2511	D	4
2512	E	4
2515	D	7
2516	E	7
2517	D	4
2518	F	4
2521	B	6
2522	A	6
2533	E	6
2534	D	6
2541	E	7
2542	F	7
2543	D	8
2544	E	7
2549	C	5
2550	C	5
2575	F	3
2580	E	4
2582	E	5
2583	B	4
2584	E	4
2585	A	8
2587	B	5
2588	A	6
2601	E	5
2602	E	5
2615	F	7
2616	F	6
2620	D	7
2634	C	7
2635	C	8
2636	D	7
2642	C	8
2644	D	6
2645	C	6
3502	E	5
3547	C	4
3565	D	7
3567	G	3
3579	D	3
3582	C	4
3583	C	4
3584	B	4
3587	C	4
3607	C	6
3631	G	4
3632	G	4
3635	B	8
3637	C	7
3690	B	7
5501	B	8
5502	G	3
5503	G	3
5504	G	3
6501	A	7
6502	B	8
6503	B	5
6504	G	4
6510	F	8
6511	F	8
7515	G	6
9503	E	4
9506	E	5
9507	A	4
9508	E	5
9509	E	5
9511	D	5
9513	F	8
9514	F	8
9515	C	6
9518	F	5
9519	G	8
9523	B	4
9524	B	4
9525	E	6
9536	G	8
9537	C	6
9544	F	8
9545	E	8
9546	E	8
9547	E	8
9548	E	8
9549	E	8
9551	G	3
9554	F	5
9557	B	6
9561	C	4
9562	A	4
9563	A	8
9566	B	6
9569	B	6
9571	E	8
9572	B	7
9573	F	5
9580	F	5
9581	C	5
9584	E	6
9589	C	6
9590	B	8
9591	G	3
9601	B	7
9620	C	1
9621	D	1
9623	E	1
9624	D	1
9625	G	4
9626	G	4

CHIP LAYOUT


8
7
6
5
4
3
A
B
C
D
E
F
G

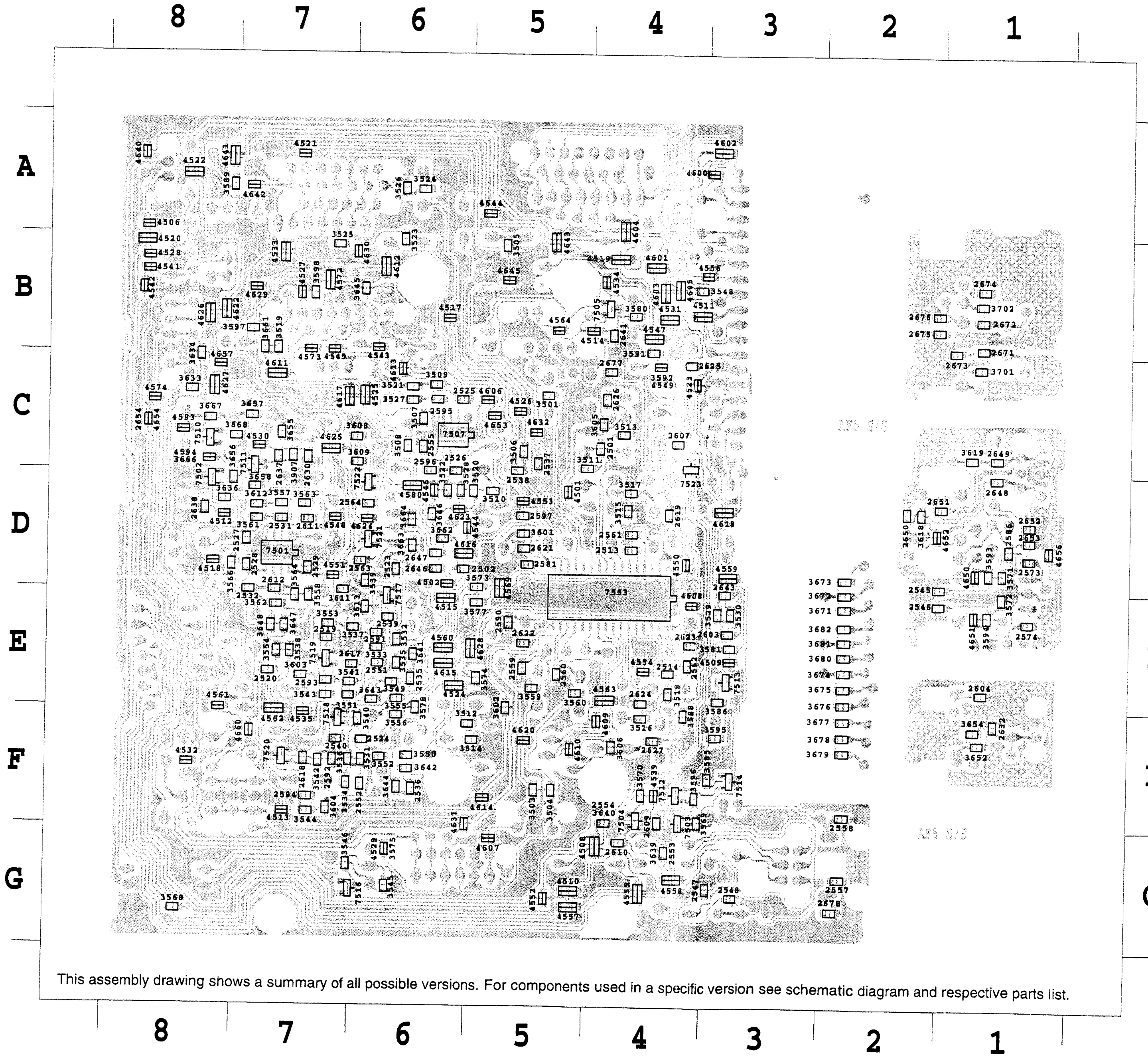
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schemat

CHIP LAYOUT



parts list.

30	C	1	2580	E	4	9536	G	8
31	B	1	2582	E	5	9537	C	6
51	F	7	2583	B	4	9544	F	8
52	B	5	2584	E	4	9545	E	8
53	G	6	2585	A	8	9546	E	8
54	B	7	2587	B	5	9547	E	8
56	A	7	2588	A	6	9548	E	8
57	B	8	2601	E	5	9549	E	8
58	A	5	2602	E	5	9551	G	3
59	A	7	2615	F	7	9554	F	5
60	F	8	2616	F	6	9557	B	6
61	C	7	2620	D	7	9561	C	4
62	F	5	2634	C	7	9562	A	4
65	A	8	2635	C	8	9563	A	8
70	B	5	2636	D	7	9566	B	6
71	F	1	2642	C	8	9569	B	6
1501	G	6	2644	D	6	9571	E	8
1503	D	8	2645	C	6	9572	B	7
1504	A	7	3502	E	5	9573	F	5
1505	D	1	3547	C	4	9580	F	5
1506	A	5	3565	D	7	9581	C	5
1507	E	2	3567	G	3	9584	E	6
1508	G	2	3579	D	3	9589	C	6
1510	B	3	3582	C	4	9590	B	8
1512	F	7	3583	C	4	9591	G	3
1513	B	3	3584	B	4	9601	B	7
1516	G	4	3587	C	4	9620	C	1
1520	D	6	3607	C	6	9621	D	1
1521	F	1	3631	G	4	9623	E	1
1522	F	2	3632	G	4	9624	D	1
1523	D	2	3635	B	8	9625	G	4
1524	A	5	3637	C	7	9626	G	4
1525	A	5	3690	B	7			
1530	B	2	5501	B	8			
1531	C	2	5502	G	3			
2503	C	5	5503	G	3			
2504	E	6	5504	G	3			
2505	C	4	6501	A	7			
2506	F	4	6502	B	8			
2507	D	4	6503	B	5			
2508	E	4	6504	G	4			
2511	D	4	6510	F	8			
2512	E	4	6511	F	8			
2515	D	7	7515	G	6			
2516	E	7	9503	E	4			
2517	D	4	9506	E	5			
2518	F	4	9507	A	4			
2521	B	6	9508	E	5			
2522	A	6	9509	E	5			
2533	E	6	9511	D	5			
2534	D	6	9513	F	8			
2541	E	7	9514	F	8			
2542	F	7	9515	C	6			
2543	D	8	9518	F	5			
2544	E	7	9519	G	8			
2549	C	5	9523	B	4			
2550	C	5	9524	B	4			
2575	F	3	9525	E	6			



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2501	C	4	2618	F	7	3528	D	6	3596	F	4	4502	D	6	4580	D	6	7514	F	3
2502	D	6	2619	D	4	3529	E	3	3597	B	7	4506	A	8	4593	C	8	7516	G	7
2513	D	4	2621	D	5	3530	E	3	3598	B	7	4508	G	4	4594	C	8	7517	E	6
2514	E	4	2622	E	5	3531	F	6	3601	D	5	4509	E	3	4600	A	3	7518	F	7
2519	E	7	2623	E	4	3532	E	6	3602	E	5	4510	G	5	4601	B	4	7519	E	7
2520	E	7	2624	E	4	3533	E	6	3603	E	7	4511	B	4	4602	A	3	7520	F	7
2523	D	6	2625	C	4	3534	F	7	3604	F	7	4512	D	8	4603	B	4	7521	D	6
2524	F	6	2626	C	4	3535	E	6	3605	C	4	4513	F	7	4604	A	4	7522	D	6
2525	C	6	2627	F	4	3536	F	7	3606	F	4	4514	B	4	4605	B	4	7523	C	4
2526	C	6	2630	C	7	3537	E	6	3608	C	6	4515	E	6	4606	C	5	7553	E	4
2527	D	7	2632	F	1	3538	E	7	3609	C	6	4517	B	6	4607	G	5			
2528	D	7	2637	C	7	3539	D	6	3611	E	7	4518	D	8	4608	E	4			
2529	D	7	2638	D	8	3540	F	6	3612	D	7	4519	B	4	4609	F	4			
2531	D	7	2641	B	4	3541	E	7	3613	E	6	4520	B	8	4610	F	5			
2532	E	7	2643	E	3	3542	F	7	3618	D	2	4521	A	7	4611	C	7			
2535	E	6	2646	D	6	3543	E	7	3619	C	1	4522	A	8	4612	B	6			
2536	F	6	2647	D	6	3544	F	7	3633	C	8	4523	C	4	4613	C	6			
2537	C	5	2648	D	1	3545	G	6	3634	C	8	4524	E	6	4614	F	5			
2538	C	5	2649	C	1	3546	G	7	3636	D	8	4525	C	6	4615	E	6			
2539	E	6	2650	D	2	3548	B	4	3639	G	4	4526	C	5	4616	D	6			
2540	F	7	2651	D	2	3549	E	6	3640	F	4	4527	B	7	4617	C	7			
2545	D	2	2652	D	1	3550	F	6	3641	E	6	4528	B	8	4618	D	3			
2546	E	2	2653	D	1	3551	E	7	3642	F	6	4529	G	6	4620	F	5			
2547	G	3	2654	C	8	3552	F	6	3643	E	6	4530	C	7	4622	B	8			
2548	G	3	2671	B	1	3553	E	7	3644	F	6	4531	B	4	4623	D	6			
2551	E	6	2672	B	1	3554	E	7	3645	B	6	4532	F	8	4624	D	6			
2552	F	6	2673	B	1	3555	E	6	3646	D	6	4533	B	7	4625	C	7			
2553	G	4	2674	B	1	3556	F	6	3647	E	7	4534	B	4	4626	B	8			
2554	F	4	2675	B	2	3557	D	7	3648	E	7	4535	F	7	4627	C	8			
2555	C	6	2676	B	2	3558	E	7	3652	F	1	4539	F	4	4628	E	5			
2557	G	2	2677	C	4	3559	E	5	3654	F	1	4541	B	8	4629	B	7			
2558	F	2	2678	G	2	3560	E	5	3655	C	7	4542	B	8	4630	B	6			
2559	E	5	3501	C	5	3561	D	7	3656	D	8	4543	B	6	4631	F	6			
2560	E	5	3503	F	5	3562	E	7	3657	C	7	4544	D	6	4632	C	5			
2561	D	4	3504	F	5	3563	D	7	3658	D	7	4545	B	7	4640	A	8			
2562	E	4	3505	B	5	3564	E	7	3661	B	7	4546	D	6	4641	A	8			
2563	D	6	3506	C	5	3566	D	8	3662	D	6	4547	B	4	4642	A	7			
2564	D	6	3507	C	6	3568	G	8	3663	D	6	4548	D	7	4643	B	5			
2573	D	1	3508	C	6	3569	F	4	3664	D	6	4549	C	4	4644	A	5			
2574	E	1	3509	C	6	3570	F	4	3666	C	8	4550	D	4	4645	B	5			
2581	D	5	3510	D	5	3571	D	1	3667	C	8	4551	D	7	4650	D	1			
2586	D	1	3511	C	5	3572	E	1	3668	C	8	4552	G	5	4651	E	1			
2590	E	5	3512	F	5	3573	D	5	3671	E	2	4553	D	5	4652	D	2			
2591	E	6	3513	C	4	3574	E	5	3672	E	2	4554	E	4	4653	C	5			
2592	F	7	3514	F	5	3575	G	6	3673	D	2	4555	G	4	4654	C	8			
2593	E	7	3515	D	4	3577	E	5	3674	E	2	4556	B	4	4656	D	1			
2594	F	7	3516	F	4	3578	F	6	3675	E	2	4557	G	5	4657	C	8			
2595	C	6	3517	D	4	3580	B	4	3676	E	2	4558	G	4	4660	F	7			
2596	C	6	3518	E	4	3581	E	3	3677	F	2	4559	D	3	7501	D	7			
2597	D	5	3519	B	7	3585	F	3	3678	F	2	4560	E	6	7502	D	8			
2603	E	3	3520	D	5	3586	E	3	3679	F	2	4561	F	8	7503	F	4			
2604	E	1	3521	C	6	3588	F	4	3680	E	2	4562	F	7	7504	F	4			
2607	C	4	3522	D	6	3589	A	8	3681	E	2	4563	E	4	7505	B	4			
2609	F	4	3523	B	6	3591	B	4	3682	E	2	4564	B	5	7507	C	6			
2610	G	4	3524	A	6	3592	C	4	3701	C	1	4569	D	5	7510	C	8			
2611	D	7	3525	B	7	3593	D	1	3702	B	1	4572	B	7	7511	C	7			
2612	E	7	3526	A	6	3594	E	1	3907	C	7	4573	B	7	7512	F	4			
2617	E	7	3527	C	6	3595	F	3	4501	D	5	4574	C	8	7513	E	3			

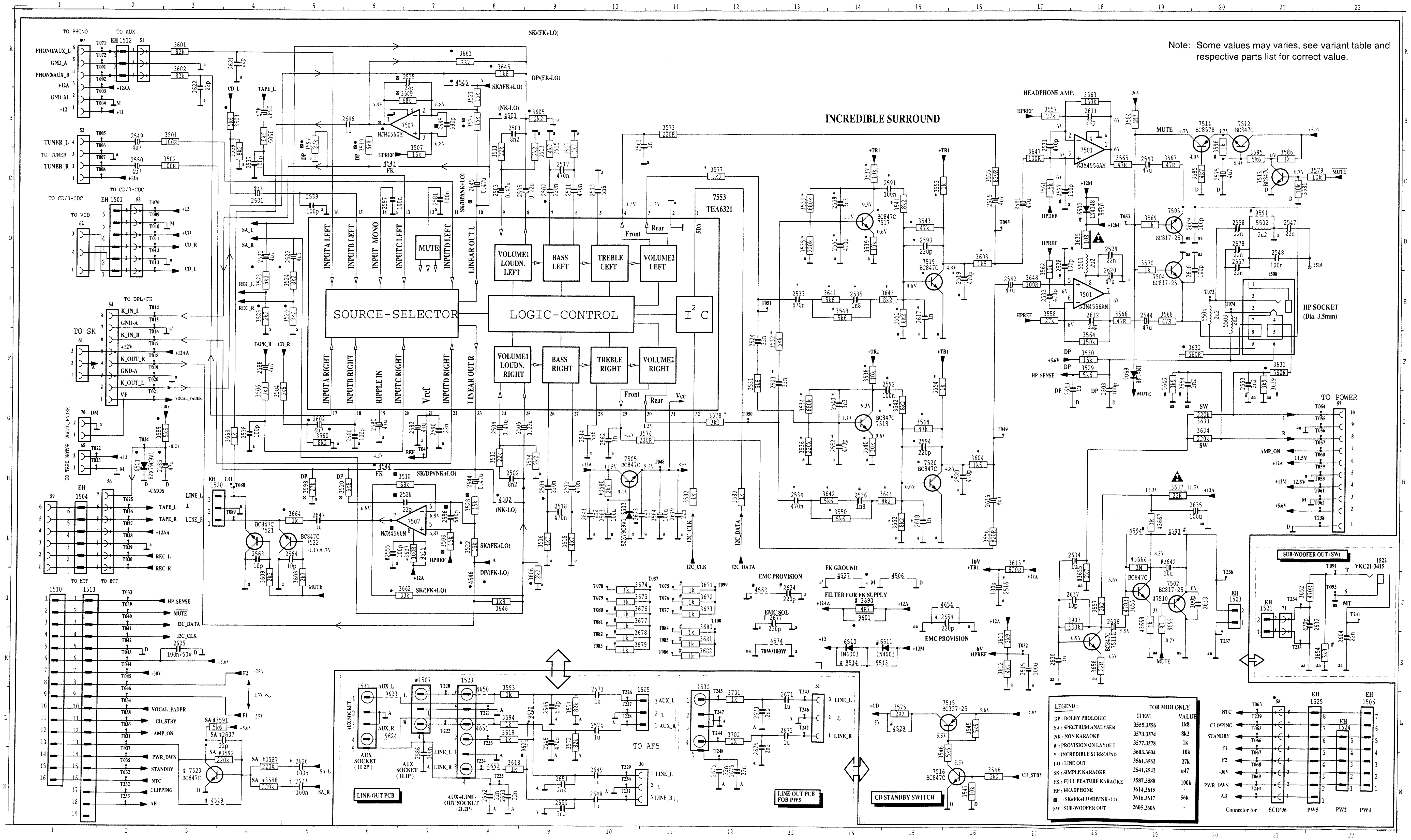
CIRCUIT DIAGRAM

1501	C 2	1521	J21	2506	G 8	2520	H16	2533	E13	2545	L 9	2558	D20	2582	G 7
1503	J20	1522	I22	2507	C 9	2521	D 4	2534	H13	2546	L 9	2559	C 5	2583	I10
1504	H 1	1523	K 8	2508	H 9	2522	D 5	2535	E14	2547	D21	2560	G 6	2584	I11
1505	K11	1524	L22	2511	C 9	2523	F13	2536	H14	2548	D21	2561	B10	2585	H 3
1506	L22	1525	L22	2512	H 9	2524	F12	2537	C 4	2549	B 2	2562	G10	2586	M 7
1507	K 7	1530	K11	2513	C10	2525	A 7	2538	G 4	2550	C 2	2563	I 4	2587	B 4
1508	E21	1531	K 6	2514	G10	2526	H 7	2539	C14	2551	D14	2564	I 5	2588	F 4
1510	J 1	2501	B 8	2515	K17	2527	C17	2540	G14	2552	G14	2573	K10	2590	G 7
1512	A 2	2502	H 8	2516	J16	2528	D17	2541	C17	2553	F20	2574	L10	2591	C15
1513	J 1	2503	C 8	2517	C 9	2529	D18	2542	E17	2554	F19	2575	C20	2592	F15
1516	D22	2504	G 8	2518	H 9	2531	B17	2543	C19	2555	I 6	2580	G 6	2593	D15
1520	H 4	2505	C 8	2519	E16	2532	E17	2544	E19	2557	D20	2581	C 7	2594	G15

2595	B 7	2615	C16	2627	M 5	2645	C 8	2673	L12	3505	B 4	3517	B 9	3529	F18
2596	I 7	2616	H16	2630	K17	2646	B 6	2674	L12	3506	G 4	3518	I 9	3530	F18
2597	C 6	2617	E15	2632	J22	2647	I 5	2675	M12	3507	C 7	3519	B 6	3531	F12
2601	C 4	2618	I15	2634	I18	2648	M10	2676	M12	3508	I 7	3520	H 6	3532	F13
2602	G 5	2619	I11	2635	H20	2649	M10	2677	J13	3509	B 7	3521	B 8	3533	C13
2603	F18	2620	E18	2636	J18	2650	M 9	2678	D20	3510	H 7	3522	I 8	3534	G13
2604	K22	2621	A 4	2637	J18	2651	M 9	30	M10	3511	C 8	3523	E 4	3535	D13
2607	L 4	2622	A 3	2638	J20	2652	M 8	31	K13	3512	H 8	3524	E 5	3536	G13
2609	D20	2623	I10	2641	I10	2653	M 8	3501	B 3	3513	C 9	3525	E 4	3537	C14
2610	E20	2624	J13	2642	I19	2654	J16	3502	C 3	3514	H 9	3526	E 5	3538	F14
2611	B18	2625	K 3	2643	F18	2671	L13	3503	B 4	3515	B 9	3527	B 8	3539	D14
2612	E18	2626	M 5	2644	H 8	2672	L13	3504	G 4	3516	I 9	3528	H 8	3540	G14

3541	C15	3553	C15	3565	C18	3578	G12	3591	L 3	3605	B 9	3633	G20	3646	J 8
3542	G15	3554	F15	3566	E18	3579	C22	3592	M 4	3606	J 9	3634	G20	3647	C17
3543	D15	3555	C16	3567	C19	3580	H10	3593	L 8	3607	I 7	3635	D18	3648	E17
3544	G15	3556	I16	3568	E19	3581	C21	3594	L 8	3608	J 5	3636	J19	3652	J21
3545	L16	3557	B17	3569	D19	3582	H11	3595	C21	3609	J 4	3637	H19	3654	K22
3546	M15	3558	E17	3570	D19	3583	H12	3596	B20	3611	K16	3639	F21	3655	J18
3547	M16	3559	C 4	3571	L 9	3584	B18	3597	B 5	3612	K16	3640	F19	3656	J19
3548	M16	3560	G 5	3572	L 9	3585	C20	3598	H 5	3613	I17	3641	E14	3657	J18
3549	E14	3561	C17	3573	B11	3586	C21	3601	A 3	3618	M 8	3642	H14	3658	K18
3550	I14	3562	D17	3574	G11	3587	M 4	3602	A 3	3619	L 8	3643	E15	3661	A 8
3551	E15	3563	B18	3575	L15	3588	M 4	3603	D16	3631	F21	3644	H15	3662	J 7
3552	I15	3564	F18	3577	C12	3589	G 2	3604	H16	3632	F20	3645	A 8	3663	G 4

3664	I 5	3679	K10	4529	L15	4652	M 8	59	H 1	71	J21	7513	C21	9513	K14
3666	I19	3680	J12	4543	C 6	51	A 2	60	A 1	7501	B18	7514	B20	9514	K14
3667	I19	3681	K12	4544	H 6	52	B 1	61	F 1	7501	E18	7515	L15	9515	I 7
3668	J19	3682	K12	4545	A 7	53	C 2	62	D 1	7502	J19	7516	M15	9590	C18
3671	J12	3690	J14	4546	J 8	54	E 2	65	G 1	7503	D19	7517	D15	9591	D21
3672	J12	3701	L12	4549	M 4	5501	D18	6501	H 2	7504	E19	7518	G15	9601	J14
3673	J12	3702	L12	4563	J12	5502	D21	6502	C18	7505	H10	7519	D15	9620	L 9
3674	J10	3907	J18	4574	K13	5503	E20	6503	H10	7507	B 6	7520	H15	9621	L 9
3675	J10	4501	B 8	4593	I19	5504	E20	6504	F19	7507	I 7	7521	I 4	9623	L 6
3676	J10	4502	H 8	4594	I19	56	H 2	6510	K14	7510	J19	7522	I 5	9624	L 6
3677	J10	4506	J15	4650	L 8	57	G22	6511	K15	7511	K18	7523	M 3		
3678	K10	4527	J14	4651	L 8	58	L21	70	G 1	7512	B20	7553	C12		


INCREDIBLE SURROUND
SOURCE-SELECTOR
LOGIC-CONTROL
I2C
7553
TEA6321
VOLUME1 LOUDN. LEFT
BASS LEFT
TREBLE LEFT
VOLUME2 LEFT
VOLUME1 LOUDN. RIGHT
BASS RIGHT
TREBLE RIGHT
VOLUME2 RIGHT
MUTE
HEADPHONE AMP.
HP SOCKET (Dia. 3.5mm)
TO PHONO
TO AUX
TO CD/3-CDC
TO SK
TO POWER
TO AF5
SUB-WOOFER OUT (SW)
LINE-OUT PCB
LINE OUT PCB FOR PW5
CD STANDBY SWITCH
AUX+LINE-OUT SOCKET (2L2P)
EMC PROVISION
FK GROUND
FILTER FOR FK SUPPLY
Connector for ECO'96 PW5 PW2 PW4

Note: Some values may varies, see variant table and respective parts list for correct value.

LEGEND :

DP : DOLBY PROLOGIC
SA : SPECTRUM ANALYSER
NK : NON KARAOKE
: PROVISION ON LAYOUT
* : INCREDIBLE SURROUND
LO : LINE OUT
SK : SIMPLE KARAOKE
FK : FULL FEATURE KARAOKE
HP : HEADPHONE
⊠ : SK/(FK+LO)/DP/(NK+LO)
SW : SUB-WOOFER OUT

FOR MIDI ONLY

ITEM	VALUE
3555,3556	1k8
3573,3574	8k2
3577,3578	1k
3603,3604	10k
3561,3562	27k
2541,2542	u47
3587,3588	100k
3614,3615	-
3616,3617	56k
2605,2606	-

9620, 9621 } Provision for Dual Aux-In

1531, 9623, 9624 } For Power 5 Only

4650, 4651 } Used when 1507 OR 1523 is used

ELECTRICAL PARTS LIST - AF5 BOARD

MISCELLANEOUS

1508	4822 267 40898	Headphone Socket
1510	4822 265 41325	Connector 16 pins
1522	4822 267 31729	Cinch Socket - Sub-Woofer out
1523	4822 267 31823	Cinch Socket - Aux / Line-out

CAPACITORS

2501	4822 126 10525	8,2nF 10% 63V
2502	4822 126 10525	8,2nF 10% 63V
2503	4822 124 41407	0,47μF 20% 63V
2504	4822 124 41407	0,47μF 20% 63V
2505	4822 124 40746	0,22μF 20% 63V
2506	4822 124 40746	0,22μF 20% 63V
2507	4822 121 42408	220nF 5% 63V
2508	4822 121 42408	220nF 5% 63V
2511	4822 121 51252	470nF 5% 63V
2512	4822 121 51252	470nF 5% 63V
2513	4822 122 32646	5,6nF 10% 50V
2514	4822 122 32646	5,6nF 10% 50V
2515	4822 124 81029	100μF 20% 25V
2516	4822 124 81029	100μF 20% 25V
2517	4822 121 51252	470nF 5% 63V
2518	4822 121 51252	470nF 5% 63V
2519	5322 122 32268	470pF 10% 50V
2520	5322 122 32268	470pF 10% 50V
2521	4822 124 40246	4,7μF 20% 63V
2522	4822 124 40246	4,7μF 20% 63V
2523	4822 126 12105	33nF 5% 63V
2524	4822 126 12105	33nF 5% 63V
2525	5322 122 32658	22pF 5% 50V
2526	5322 122 32658	22pF 5% 50V
2529	5322 122 32654	22nF 10% 63V
2531	5322 122 32268	470pF 10% 50V
2532	5322 122 32268	470pF 10% 50V
2533	4822 121 51252	470nF 5% 63V
2534	4822 121 51252	470nF 5% 63V
2535	4822 126 10847	1,8nF 10% 63V
2536	4822 126 10847	1,8nF 10% 63V
2537	5322 122 32531	100pF 5% 50V
2538	5322 122 32531	100pF 5% 50V
2539	4822 122 33891	3,3nF 10% 63V
2540	4822 122 33891	3,3nF 10% 63V
2541	4822 124 41751	47μF 20% 50V
2542	4822 124 41751	47μF 20% 50V
2543	4822 124 41751	47μF 20% 50V
2544	4822 124 41751	47μF 20% 50V
2545	5322 122 32268	470pF 10% 50V
2546	5322 122 32268	470pF 10% 50V
2547	5322 122 32654	22nF 10% 63V
2548	4822 126 10002	100nF 20% 25V
2549	4822 124 40246	4,7μF20% 63V
2550	4822 124 40246	4,7μF 20% 63V
2551	5322 122 32268	470pF 10% 50V
2552	5322 122 32268	470pF 10% 50V
2557	5322 122 32654	22nF 10% 63V
2558	5322 122 32654	22nF10% 63V
2559	5322 122 32531	100pF 5% 50V
2560	5322 122 32531	100pF 5% 50V
2561	5322 122 34123	1nF 10% 50V
2562	5322 122 34123	1nF 10% 50V
2563	5322 122 32448	10pF 5% 50V
2564	5322 122 32448	10pF 5% 50V
2573	4822 126 13836	1μF 16V
2574	4822 126 13836	1μF 16V
2575	4822 124 40246	4,7μF 20% 63V
2580	4822 124 41751	47μF 20% 50V
2581	4822 126 10002	100nF 20% 25V
2582	4822 124 41751	47μF 20% 50V
2583	4822 124 81029	100μF 20% 25V
2584	4822 124 81029	100μF 20% 25V
2585	4822 124 41751	47μF 20% 50V
2587	4822 124 40246	4,7μF 20% 63V
2588	4822 124 40246	4,7μF 20% 63V
2590	5322 122 32654	22nF 10% 63V
2591	4822 126 10002	100nF 20% 25V
2592	4822 126 10002	100nF 20% 25V
2593	4822 122 33575	220pF 5% 50V
2594	4822 122 33575	220pF 5% 50V
2595	4822 122 32535	680pF 10% 63V
2596	4822 122 32535	680pF 10% 63V
2597	4822 126 10002	100nF 20% 25V
2601	4822 124 40246	4,7μF 20% 63V
2602	4822 124 40246	4,7μF 20% 63V
2603	5322 122 32531	100pF 5% 50V
2604	5322 122 32654	22nF 10% 63V
2609	5322 122 32531	100pF 5% 50V
2610	5322 122 32531	100pF 5% 50V
2611	5322 122 32658	22pF 5% 50V
2612	5322 122 32658	22pF 5% 50V
2615	4822 124 40246	4,7μF 20% 63V
2616	4822 124 40246	4,7μF 20% 63V
2617	5322 122 34123	1nF 10% 50V
2618	5322 122 34123	1nF 10% 50V
2619	5322 122 32654	22nF 10% 63V
2620	4822 124 40433	47μF 20% 25V
2621	5322 122 32658	22pF 5% 50V
2622	5322 122 32658	22pF 5% 50V
2623	5322 126 10223	4,7nF 10% 63V
2625	4822 126 10002	100nF 20% 25V
2630	5322 122 34123	1nF 10% 50V
2632	5322 122 32268	470pF 10% 50V
2634	4822 124 40242	1μF 20% 63V
2635	4822 124 81029	100μF 20% 25V

ELECTRICAL PARTS LIST - AF5 BOARD

2636	4822 124 40242	1μF 20% 63V
2637	5322 122 32448	10pF 5% 50V
2638	5322 122 32531	100pF 5% 50V
2641	4822 122 33175	2,2nF 20% 50V
2643	4822 126 13836	1μF 16V
2644	4822 124 41407	0,47μF 20% 63V
2645	4822 124 41407	0,47μF 20% 63V
2646	4822 126 13836	1μF 16V
2647	4822 126 13836	1μF 16V
2648	4822 126 13836	1μF 16V
2649	4822 126 13836	1μF 16V
2650	4822 122 33175	2,2nF 20% 50V
2651	4822 122 33175	2,2nF 20% 50V
2652	5322 122 32654	22nF 10% 63V
2653	5322 122 32654	22nF 10% 63V
2654	4822 122 33575	220pF 5% 50V
2678	5322 122 32654	22nF 10% 63V

RESISTORS

3501	4822 051 20101	100R 5% 0,1W
3502	4822 116 52175	100R 5% 0,5W
3503	4822 051 20562	5k6 5% 0,1W
3504	4822 051 20562	5k6 5% 0,1W
3505	4822 051 20332	3k3 5% 0,1W
3506	4822 051 20332	3k3 5% 0,1W
3507	4822 051 20153	15k 5% 0,1W
3508	4822 051 20153	15k 5% 0,1W
3509	4822 051 20683	68k 5% 0,1W
3510	4822 051 20683	68k 5% 0,1W
3511	4822 051 20223	22k 5% 0,1W
3512	4822 051 20223	22k 5% 0,1W
3513	4822 117 11449	2k2 1% 0,1W
3514	4822 117 11449	2k2 1% 0,1W
3515	4822 051 20472	4k7 5% 0,1W
3516	4822 051 20472	4k7 5% 0,1W
3517	4822 051 20472	4k7 5% 0,1W
3518	4822 051 20472	4k7 5% 0,1W
3519	4822 117 11507	6k8 1% 0,1W
3520	4822 117 11507	6k8 1% 0,1W
3521	4822 051 20153	15k 5% 0,1W
3522	4822 051 20153	15k 5% 0,1W
3523	4822 051 20822	8k2 5% 0,1W
3524	4822 051 20822	8k2 5% 0,1W
3525	4822 051 20332	3k3 5% 0,1W
3526	4822 051 20332	3k3 5% 0,1W
3527	4822 051 20153	15k 5% 0,1W
3528	4822 051 20153	15k 5% 0,1W
3529	4822 051 20562	5k6 5% 0,1W
3530	4822 051 20153	15k 5% 0,1W
3531	4822 051 20562	5k6 5% 0,1W
3532	4822 051 20562	5k6 5% 0,1W
3533	4822 051 20684	680k 5% 0,1W
3534	4822 051 20684	680k 5% 0,1W
3535	4822 051 20224	220k 5% 0,1W
3536	4822 051 20224	220k 5% 0,1W
3537	4822 117 10833	10k 1% 0,1W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 20822	8k2 5% 0,1W
3542	4822 051 20822	8k2 5% 0,1W
3543	4822 117 10834	47k 1% 0,1W
3544	4822 117 10834	47k 1% 0,1W
3545	4822 051 20562	5k6 5% 0,1W
3546	4822 051 20562	5k6 5% 0,1W
3547	4822 116 83864	10k 5% 0,5W
3548	4822 117 11449	2k2 1% 0,1W
3549	4822 051 20562	5k6 5% 0,1W
3550	4822 051 20562	5k6 5% 0,1W
3551	4822 051 20822	8k2 5% 0,1W
3552	4822 051 20822	8k2 5% 0,1W
3553	4822 051 10102	1k 2% 0,25W
3554	4822 051 10102	1k 2% 0,25W
3555	4822 117 11454	820R 1% 0,1W
3556	4822 117 11454	820R 1% 0,1W
3557	4822 051 20273	27k 5% 0,1W
3558	4822 051 20273	27k 5% 0,1W
3559	4822 051 20822	8k2 5% 0,1W
3560	4822 051 20822	8k2 5% 0,1W
3561	4822 051 20153	15k 5% 0,1W
3562	4822 051 20153	15k 5% 0,1W
3563	4822 051 20104	100k 5% 0,1W
3564	4822 051 20104	100k 5% 0,1W
3565	4822 116 52195	47R 5% 0,5W
3566	4822 051 20479	47R 5% 0,1W
3567	4822 116 52195	47R 5% 0,5W
3568	4822 051 20479	47R 5% 0,1W
3569	4822 051 10102	1k 2% 0,25W
3570	4822 051 10102	1k 2% 0,25W
3571	4822 117 11149	82k 1% 0,1W
3572	4822 117 11149	82k 1% 0,1W
3573	4822 117 11503	220R 1% 0.1W
3574	4822 117 11503	220R 1% 0.1W
3575	4822 051 20228	2R2 5% 0,1W
3577	4822 051 20472	4k7 5% 0,1W
3578	4822 051 20472	4k7 5% 0,1W
3579	4822 116 83864	10k 5% 0,5W
3581	4822 117 10833	10k 1% 0,1W
3582	4822 050 11002	1k 1% 0,4W
3583	4822 050 11002	1k 1% 0,4W
3584	4822 050 24705	4M7 1% 0,6W
3585	4822 051 20472	4k7 5% 0,1W

ELECTRICAL PARTS LIST - AF5 BOARD

RESISTORS

3586	4822 051 10102	1k 2% 0,25W
3589	4822 051 20562	5k6 5% 0,1W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3595	4822 051 20562	5k6 5% 0,1W
3597	4822 051 20273	27k 5% 0,1W
3598	4822 051 20273	27k 5% 0,1W
3601	4822 117 11149	82k 1% 0,1W
3602	4822 117 11149	82k 1% 0,1W
3603	4822 117 11139	1k5 1% 0,1W
3604	4822 117 11139	1k5 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 117 11449	2k2 1% 0,1W
3608	4822 117 11449	2k2 1% 0,1W
3609	4822 117 11449	2k2 1% 0,1W
3611	4822 051 20392	3k9 5% 0,1W
3612	4822 051 20472	4k7 5% 0,1W
3613	4822 117 11454	820R 1% 0,1W
3618	4822 051 10102	1k 2% 0,25W
3619	4822 051 10102	1k 2% 0,25W
3631	4822 116 52226	560R 5% 0,5W
3632	4822 116 52226	560R 5% 0,5W
3633	4822 051 20224	220k 5% 0,1W
3634	4822 051 20224	220k 5% 0,1W
3635	4822 052 10109 ⚠	10R 5% 0,33W
3636	4822 051 10102	1k 2% 0,25W
3637	4822 052 10229 ⚠	22R 5% 0,33W
3641	4822 051 20562	5k6 5% 0,1W
3642	4822 051 20562	5k6 5% 0,1W
3643	4822 051 20822	8k2 5% 0,1W
3644	4822 051 20822	8k2 5% 0,1W
3645	4822 051 20182	1k8 5% 0,1W
3646	4822 051 20182	1k8 5% 0,1W
3647	4822 051 20101	100R 5% 0,1W
3648	4822 051 20101	100R 5% 0,1W
3652	4822 051 20471	470R 5% 0,1W
3654	4822 051 20392	3k9 5% 0,1W
3656	4822 051 20471	470R 5% 0,1W
3657	4822 117 11449	2k2 1% 0,1W
3658	4822 051 20229	22R 5% 0,1W
3663	4822 051 10102	1k 2% 0,25W
3664	4822 051 10102	1k 2% 0,25W
3674	4822 051 20153	15k 5% 0,1W
3675	4822 051 20332	3k3 5% 0,1W
3675	4822 117 11449	2k2 1% 0,1W for /21
3907	4822 051 20334	330k 5% 0,1W
4506	4822 051 20008	0R Jumper 0805
4508	4822 051 10008	0R Jumper 1206
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 10008	0R Jumper 1206
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 10008	0R Jumper 1206
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 10008	0R Jumper 1206
4520	4822 051 10008	0R Jumper 1206
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 10008	0R Jumper 1206
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 10008	0R Jumper 1206
4525	4822 051 10008	0R Jumper 1206
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 10008	0R Jumper 1206
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 10008	0R Jumper 1206
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4548	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4552	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 10008	0R Jumper 1206
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 10008	0R Jumper 1206
4558	4822 051 10008	0R Jumper 1206
4559	4822 051 10008	0R Jumper 1206
4560	4822 051 10008	0R Jumper 1206
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 10008	0R Jumper 1206
4569	4822 051 10008	0R Jumper 1206
4572	4822 051 10008	0R Jumper 1206
4573	4822 051 20008	0R Jumper 0805
4574	4822 051 20008	0R Jumper 0805
4580	4822 051 10008	0R Jumper 1206
4593	4822 051 20008	0R Jumper 0805
4594	4822 051 20008	0R Jumper 0805
4601	4822 051 10008	0R Jumper 1206
4603	4822 051 10008	0R Jumper 1206
4604	4822 051 10008	0R Jumper 1206
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4608	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - AF5 BOARD

RESISTORS

4609	4822 051 20008	0R Jumper 0805
4610	4822 051 20008	0R Jumper 0805
4611	4822 051 10008	0R Jumper 1206
4612	4822 051 10008	0R Jumper 1206
4613	4822 051 20008	0R Jumper 0805
4614	4822 051 20008	0R Jumper 0805
4615	4822 051 10008	0R Jumper 1206
4616	4822 051 10008	0R Jumper 1206
4617	4822 051 10008	0R Jumper 1206
4618	4822 051 10008	0R Jumper 1206
4622	4822 051 10008	0R Jumper 1206
4623	4822 051 20008	0R Jumper 0805
4624	4822 051 20008	0R Jumper 0805
4625	4822 051 10008	0R Jumper 1206
4626	4822 051 10008	0R Jumper 1206
4628	4822 051 10008	0R Jumper 1206
4629	4822 051 20008	0R Jumper 0805
4630	4822 051 20008	0R Jumper 0805
4631	4822 051 20008	0R Jumper 0805
4632	4822 051 20008	0R Jumper 0805
4640	4822 051 20008	0R Jumper 0805
4641	4822 051 10008	0R Jumper 1206
4642	4822 051 20008	0R Jumper 0805
4643	4822 051 10008	0R Jumper 1206
4644	4822 051 20008	0R Jumper 0805
4645	4822 051 20008	0R Jumper 0805
4650	4822 051 20008	0R Jumper 0805
4651	4822 051 20008	0R Jumper 0805
4652	4822 051 20008	0R Jumper 0805
4653	4822 051 20008	0R Jumper 0805
4657	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5501	4822 157 11477	Fixed Inductor 2µ2 5%
5502	4822 157 11477	Fixed Inductor 2µ2 5%
5503	4822 157 11477	Fixed Inductor 2µ2 5%
5504	4822 157 11477	Fixed Inductor 2µ2 5%

DIODES

6501	4822 130 30862	BZX79-C9V1
6503	4822 130 30862	BZX79-C9V1
6504	4822 130 30621	1N4148
6510	4822 130 31878	1N4003G
6511	4822 130 31878	1N4003G

TRANSISTORS & INTEGRATED CIRCUITS

7501	4822 209 31378	NJM4556AM
7502	4822 130 42804	BC817-25
7503	4822 130 42804	BC817-25
7504	4822 130 42804	BC817-25
7505	5322 130 42755	BC847C
7507	4822 209 83357	NJM4560M
7511	5322 130 42755	BC847C
7512	5322 130 42755	BC847C
7513	5322 130 42755	BC847C
7514	5322 130 60508	BC857B
7515	4822 130 41246	BC327-25
7516	5322 130 42755	BC847C
7517	5322 130 42755	BC847C
7518	5322 130 42755	BC847C
7519	5322 130 42755	BC847C
7520	5322 130 42755	BC847C
7521	5322 130 42755	BC847C
7522	5322 130 42755	BC847C
7553	4822 209 33652	TEA6321T/V1

Note: Only the parts mentioned in this list are normal service spare parts.

FW765P/FW795W

A98 - 153

Service
Service
Service

Product Service Group CE Audio

Service Information

Already published Service Informations:

CORRECTIONS TO SERVICE MANUAL

- Page 3-3 : Addition of Temperature test (see Figure 1).

- Due to some adaptation, the new Variant Table for the Front Board and AF5 Board are enclosed.

ADDITIONS TO SERVICE MANUAL

- Selected spare parts are now available for the Left & Right Loudspeaker Boxes.

4822 464 10433	Cloth Frame
4822 464 10458	Cloth Frame for FW795W/37
4822 240 10314	Woofer 6,5" 40W
4822 240 10303	Tweeter 2,5" 40W

CHANGES DURING PRODUCTION

MAIN UNIT

- From production week 9840 the following has been changed for new UL requirement.

Change	385	4822 321 11466	Mains Cords (For FW795W/37)

FRONT BOARD

- From production week 9824 onwards layout stage .3 (identified by the last digit of the 12-digit code printed on the copper pattern) is implemented. For this reason a new Layout and Circuit drawings are enclosed.
  Reasons :
  - To pull unused port to ground (clip detection port).

Add	3409	4822 051 20471	470R 5% 0,1W
Delete	4441		
Delete	9451	Bare Wire	

  - To correct the FTD voltage to reduce the brightness of the FTD display.

Add	3621	4822 116 81154	2R2 5% 0,5W
	3622	4822 116 81154	2R2 5% 0,5W
	4550	4822 051 20008	0R Jumper 0805
	4551	4822 051 20008	0R Jumper 0805
Delete	3561 , 3562		
Delete	9471 , 9600	Bare Wires	

- From production week 9837 the following has been changed for solution to LEDs flashing.

Change	3580	4822 051 20472	4k7 5% 0,1W

AF5 BOARD

- From production week 9820 the following has been changed to cut Bass response to match speaker boxes.

Change	2541	4822 124 40746	0,22µF 20% 63V
	2542	4822 124 40746	0,22µF 20% 63V

- From production week 9820 the following has been changed for DPL attenuation for Power 4.

Change	3605	4822 117 11139	1k5 1% 0,1W
	3606	4822 117 11139	1k5 1% 0,1W

- From production week 9820 onwards layout stage .2 (identified by the last digit of the 12-digit code printed on the copper pattern) is implemented.
  Reason : Re-layout to improve EMC performance.

  Delete 4521 , 4644

- From production week 9830 the following has been changed due to grounding change and EMC purpose.

Add	4620	4822 051 20008	0R Jumper 0805
	4654	4822 051 20008	0R Jumper 0805
Delete	2654		

- From production week 9833 onwards layout stage .3 (identified by the last digit of the 12-digit code printed on the copper pattern) is implemented. For this reason a new Layout and Circuit drawing are enclosed.

  Reasons : - To change the tape deck motor supply to +12M instead of +12.
  - Re-orientation of Dipmate 31 to improve production process.

1998 - 09 - 08

4822 725 25822

DOLBY PRO-LOGIC

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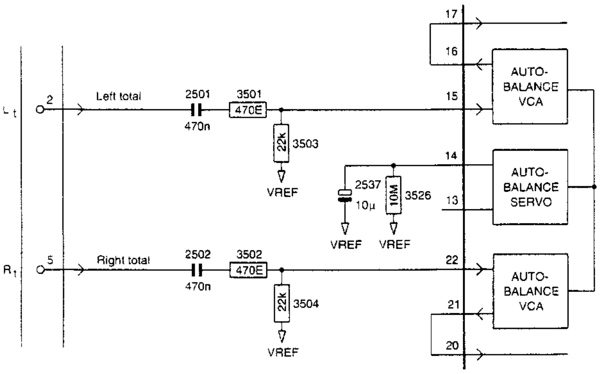
Circuit Description 13-2
Dolby Pro-logic CD Test Description 13-3
Circuit Diagram 13-6
Layout Diagram 13-7
Electrical parts list.. 13-8

CIRCUIT DESCRIPTION

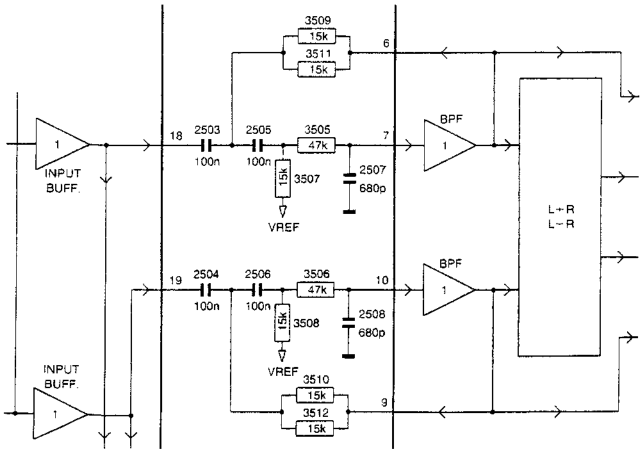
1 - Automatic balance control circuit:

The first section in the Dolby Proloic decoder IC7501 (MC69032) is Auto balance circuit, to correct input balance errors between Lt and Rt. signals.


Lt
2
Left total
2501
470n
3501
470E
22k
3503
VREF
2537
10µ
10M
3526
VREF
VREF
Rt
5
Right total
2502
470n
3502
470E
22k
3504
VREF
17
16
15
14
13
22
21
20
AUTO-BALANCE VCA
AUTO-BALANCE SERVO
AUTO-BALANCE VCA

This is vital to ensure that the following matrix stage givesoptimal results.
The previons generation (Dolby surround) haed an external Left & Right balance control.
To be able to set to correct balance the customer must first switch off the center speaker and select a dialogue.
Then Left & Right can be set for minimum dialogue coming out of the Left & Right speakers.
Now through the automatically balance circuit (internally implemented) the center mode off is not needed anymore (but is still possible with this device).
FW670: No center mode OFF feature.

2 - Adaptive matrix stage
(The heart of the active decoder)

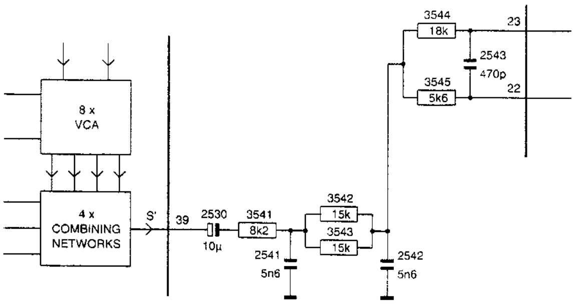

3509
15k
3511
15k
6
1
INPUT BUFF.
18
2503
100n
2505
100n
3505
47k
7
15k
3507
VREF
2507
680p
BPF
1
L+R
L−R
19
2504
100n
2506
100n
3506
47k
10
15k
3508
VREF
2508
680p
BPF
1
INPUT BUFF.
1
3510
15k
3512
15k
9

The complex matrix stage splits-up the encoded Lt - Rt signals into Left, Right, Center (L=R) and Surround (L-R) signals
The function of this circuit is to analyse continuously the two channel audio input to determine the direction and relative magnitude of the encoded soundfield (improving directional location).

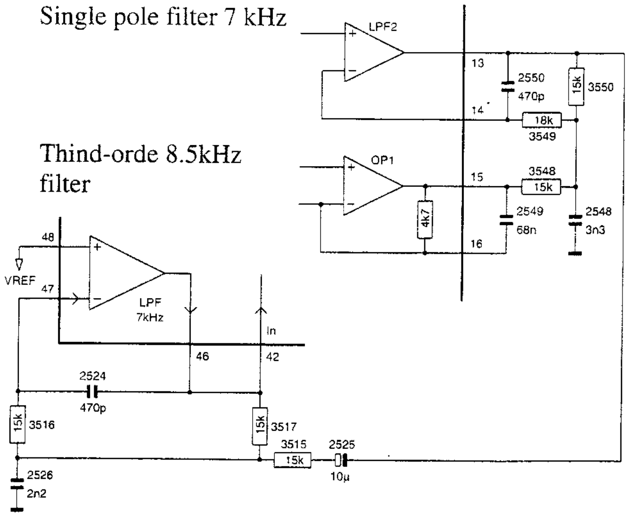
3 - Filters in surround path .

The first block in the surround path is an ANTI ALIAS filter, to prevent spurious beat product occurring as a result of the sampling process in the time delay stage.

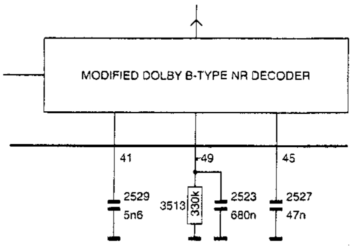
ANTI ALIAS filter,


8 x VCA
4 x COMBINING NETWORKS
S'
39
2530
10µ
3541
8k2
2541
5n6
3542
15k
3543
15k
2542
5n6
3544
18k
23
2543
470p
3545
5k6
22

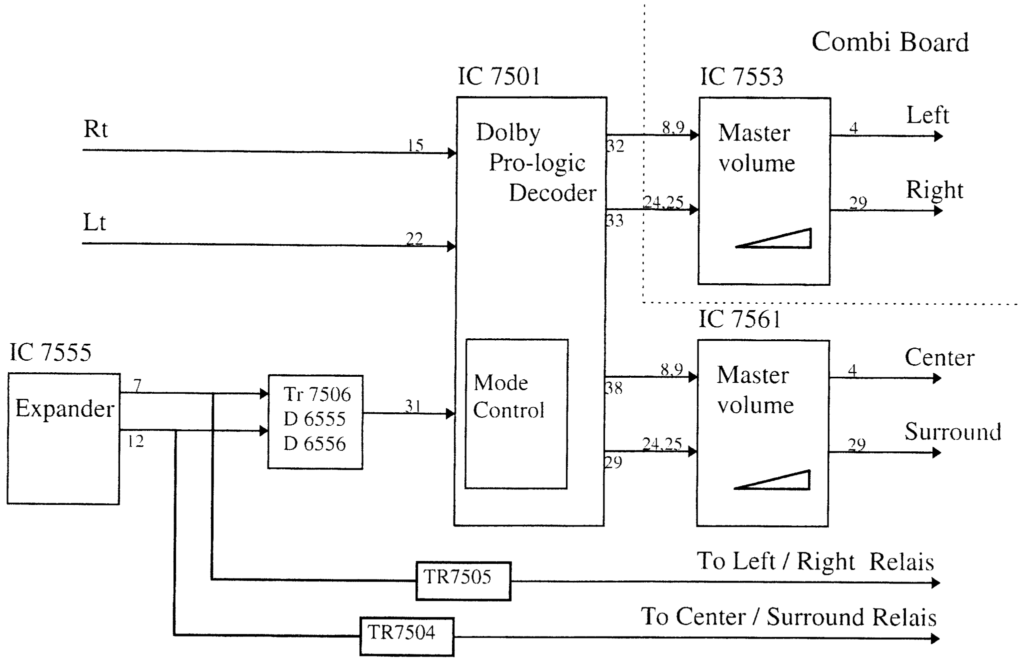
The next filter must have at least a 12 dB per octave slope above the breaking point.
A single pole filter at 7kHz is followed by a third-order filter at 8.5kHz, together giving the proper cut off frequency and steeper roll-off for rejection of BBD clock signals. (**B**ucket - **B**rigade - **D**evices)


Single pole filter 7 kHz
Thind-orde 8.5kHz filter
LPF2
13
14
2550
470p
15k
3550
18k
3549
OP1
15
3548
15k
4k7
2549
68n
2548
3n3
16
48
VREF
47
LPF 7kHz
In
46
42
2524
470p
15k
3516
15k
3517
3515
15k
2525
10µ
2526
2n2

Modified Dolby B type NR (Noise Reduction) decoder is used to reduce the signal to noise ratio in the surround channel and the leakage of high frequency components from the front into the surround channel
Modified Dolby B type NR decoder stage makes correct Dolby B decoding possible


MODIFIED DOLBY B-TYPE NR DECODER
41
49
45
2529
5n6
3513
330k
2523
680n
2527
47n

4 - Mode control circuit



The decoded signals, left,right,center,surround can be switched into the following modes:

Channel mode:

2 channel mode :

original stereo mode (Left and Right output)
- pin7 = high, pin12 = low IC 7555
- pin 31 = low IC 7501

3 channel mode :

No surround speaker available (L,R,C)
The surround information is equally added to the left and right outputs.
-pin 7= low, pin 12 high IC 7555
-pin31 = open input IC 7501 (typical 2...3V)

4 channel mode :

Pro-logic --> all four outputs are used (L,R C,S)
-pin7 = high, pin 12 high IC 7555
-pin31 = high IC 7501

Center mode:

center mode Wide :

Full frequency range in center channel 20Hz.....20kHz. The customer needs a better specified center speaker for this mode (with woofer)

center mode Normal :

-3 dB breakpoint (roll off) at 100Hz, frequency response 100 Hz......20kHz .The customer can place a simple center speaker . To prevent loss of Bass center information these bass < 100Hz is equally added to the left and right full wave speakers.

center mode Phantom :

No center speaker available. To prevent loss of center information these center information (20Hz......20kHz) is equally added to the left and right speakers.

TEST CD DOLBY PROLOGIC TEST DESCRIPTION

- The intention of this description is to explain the most important performance measurements for **DPL** (**D**olby **Pro-Logic**) sets for service.

- Test instruments (recommended) :
  - Dolby Prologic test CD 4822 395 10216
  - AC mv meters (4x) L, C, R, S
  - Oscilloscope (double beam)
  - Distortion meter
  - CD player.

WARNING: Be sure that the ground connection (-) of each instrument is not connecteded with the safety earth ⊥ connection. To avoid damage to output amplifiers (balance type) Use only cinch (input) ground connection

STARTING CONDITION :

- Replace the loudspeakers for all four output amplifiers with loud resistors according the output impedance for each amplifier (or use 8 Ω as standard loudresistor).
- Set volume to min. position
- Switch off all features like ASP setting, DBB etc...
- Set "TONE CONTROL" in "FLAT" mode.
- Select the "PRO LOGIC" mode.
- Select "WIDE" mode for Centre channel in sets with this options.
- Set time delay in Surround channel at 20 msec. in sets with variable time delay.
- Dolby Prologic test CD in CD player.

SERVICE TEST DESCRIPTION

Test 1 : *Output and balance setting for all four channels*

Select track 2 :

Adjust L, C, R and S for ≈ 1W output on the loudresistor with master volume. Adjust with L/R balance and Centre/Surround "TRIM" all four channels to equal level (equal meter readings)

Note: 1Watt output corresponds with 2.83V across 8 Ω

$P = U^2/R \rightarrow U = \sqrt{P \text{ x } R} = \sqrt{1\text{x } 8} = 2{,}83V$

Test 2 : *Frequency response for Left and Right channel*

Requirement : -3 dB points at ≤ 50 Hz and ≥ 15 kHz

Select track 3:

measure (and note) the overall gain of Left channel across the load resistor.

Select track 4:

measure (and note) the overall gain on Right channel across the load resistor.

Test 3 : *Frequency response for Center channel*

2 possibilitie :

1- Center mode "wide" requirements : -3 dB at ≤ 50 Hz and > 15 kHz (same as L/R requirements)

2- Center mode "normal" requirements : -3 dB point at ± 100 Hz and ≥ 15 kHz (the difference is the roll-off behaviour of the bass frequencies).

Select track 5 :

measure (and note) the overall gain of Center channel across the load resistor in "wide" mode (only in sets with this option) and repeat this measurement in "normal" mode.

Test 4 : *Frequency response for Surround channel*

Surround requirements : -3 dB point at ≤ 100 Hz and ± 7 kHz (6 kHz ... 8 kHz)

The difference is the roll-off behaviour of the high treble frequencies.

Select track 6 :

measure (and note) the overall gain of Surround channel across the loud resistor.

Test 5 : *Modified Dolby B type NR decoding freq. response of the Surround channel*
Requirement : Roll off behaviour at ± 5 kHz related to 100 Hz. In this case use 100 Hz as 0 dB reference gain.
Select track 14:
measure (and note) the overall gain of Surround channel across the load resistor.
Note : The output level on track 14 = -35 dB below the 1W output reference of the Surround channel.

Test 6 :*Total harmonic distortion measurements for Left, Center, Right, Surround channels for 1 Watt output*
Note : If necessary use a special CD test filter 20 Hz ... 20 kHz between the output channel and the distortion meter to prevent spurrious products out of audio waves (> 20 kHz) from to the CD player in test.
Select track 3 :
Measure distortion at 1 kHz across the Left channel.
Output load resistor : requirement THD < 0,3 %
Select track 4 :
Measure distortion at 1 kHz across the Right channel.
Output load resistor : requirement THD < 0,3 %
Select track 5 :
Measure distortion at 1 kHz across the Center channel.
Output load resistor : requirements THD < 0,3 %
Center mode "wide" (if exists) and repeat for center mode "normal"
Select track 6 :
Measure distortion at 1 kHz across the Surround channel load resistor.
Note : time delay setting = 20 msec.
Requirement THD = < 0,5 %

Test 7: *Signal to noise measurements for Left output amplifier*
Select track 3 :
Use 1W output at 1 kHz on the Left channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/Nratio.
Requirements for Left channel ≤ -65 dB

Test 8 : *Signal to noise measurements for Right output amplifier*
Select track 4 :
Use 1W output at 1 kHz on the Right channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Right channel ≤ -65 dB
Test 9 : *Signal to noise measurements for Center output amplifier*
Select track 5 :
Uuse 1W output at 1 kHz on the Center channel (normal or wide mode)
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Center channel (normal or wide mode) ≤ -65 dB

Test 10 : *Signal to noise measurements for Surround output amplifier*
Select track 6 :
Use 1W output at 1 kHz on the Surround channel output loud resistor as 0 dB reference.
Select track 13 :
(silence) and measure the S/N ratio.
Requirement for Surround channel ≤ -55 dB (in all positions between 15 msec ... 30 msec in sets with variable time delay).

Cross-talk (channel separation) between adjacent and opposite channels
2 possibilities :
1- Centre mode "wide" (if exists)(use 1 kHz tone)
Test 11a:
Select track 3 :
For 1 kHz in Left channel and measure the crosstalk in Center, Right, Surround.
Requirement : < -25 dB
Test 12a :
Select track 4 for 1 kHz in Right channel and measure the crosstalk in Surround , Left, Center.
Requirement : < -25 dB

Test 13a :
Select track 5 :
For 1 kHz in Center channel and measure the crosstalk in Left, Right, Surround.
Requirement : < -25 dB
Test 14a :
Select track 6 :
For 1 kHz in Surround channel and measure the crosstalk in Left, Center, Right.
Requirement : < -25 dB
2- Centre mode "normal" (use 3 kHz or 1 kHz tone)
Test 11b :
Select track 3 :
For 3 kHz in Left channel and measure the crosstalk in Center, Right, Surround
Requirement : < -25 dB
Test 12b :
Select track 4 :
For 3 kHz in Right channel and measure the crosstalk in Surround, Left, Center
Requirement : < -25 dB
Test 13b :
Select track 5 :
For 3 kHz in Centre channel and measure the crosstalk in Left, Right, Surround
Requirement : < -25 dB
Test 14b :
Select track 6 :
For 1 kHz in Surround channel and measure the crosstalk in Left, Center, Right
Requirement : < -25 dB

Inputs overload test (headroom to visible clipping)
General :
Before starting these tests set Master Volume -15 dB lower to make a new output reference (1W on loudresistors).
Requirement : check on scope for no visible signal clipping or measure THD <1,5 %
Test 15 :
Select track 7 :
Check the Left output signal between 20 Hz ... 20 kHz
Test 16 :
Select track 8 :
Check the Right output signal between 20 Hz ... 20 kHz
Test 17 :
Select track 9 :
Check the Center output signal
CENTER "NORMAL" between 100 Hz ... 20 kHz
CENTER "WIDE" between 20 Hz ... 20 kHz
Test 18 :
Select track 11 :
Check the Surround output signal between 50 Hz ... 7 kHz

Test 19 :*Center Mode Check*
Select Center "Normal" mode
a - Select track 5 at 1 kHz :
Adjust the Center output again with master volume for 1W output as 0 dB reference.
b - Select on track 5 the 100 Hz :
Signal to check the roll-off behaviour at -3 dB on the Center output
c - Select on track 5 the 50 Hz :
Signal and measure on the Left and Right output channels.
The lost 50 Hz signal on the Center output is equally splitted and added to the L and R channels.

Test 20 : *Center Mode Check*
Select Center "wide" mode (if exists)
Repeat test 19 a,b and c
The difference is no roll off behaviour at 100 Hz (Center) and no splitted bass (50 Hz signal) added to L and R channel.

Test 21 : *Center Mode Check*
Select Center mode phantom
Select track 5 (20 Hz ... 20 kHz) :
No output signals on the Center output or at least minimum -40 dB related to 1W outputs.
Measure now on the Left and Right output channels : the lost Center signals are equally splitted and added to these left and right channels (- 3 dB)

Test 22 : *3 CH mode control*
Select track 6 (100 Hz ... 7 kHz):
No output signals on the Surround output channel or at least minimum -40 dB related to 1W output.
Measure now at the Left and Right output channels : the lost Surround signals are equally splitted and added to the Left and Right output channels (-3 dB)

Test 23 : *2 CH mode control (stereo)*
Select track 5 :
No output on Centre output channel
Select track 6 :
No output on Surround output channel

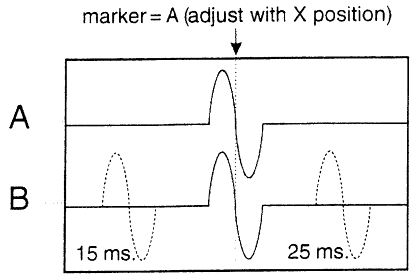
Test 24 : *Time delay control in Surround channel*

- Principle description encoded burst signal spots (see fig. 1)
  1- Tone burst 1 kHz during 1 msec with interval time at 20 msec are given at the same time to the L_t; R_t inputs (in phase 0°)
  2- The next tone burst is given at the same time to the L_t R_t input, but in reverse phase to the R_t input (180°).
  These 2 tone bursts are repeated continuously during 2 minutes.
- Principle description decoded signal spots in Center/Surround channel
  - In case of 20 msec time delay mode the results are shown in fig. 1 in Center and Surround channel.
    The center spots in Center channel can be used as "Marker" spots (trigger signal) → repeated every 40 msec.
    The delayed surround spots occur at the same time as the center spots (markers)
  - When time delay mode is changed to 15 msec the delayed surround spots move to the left with respect to the centre mark spots.
  - When time delay mode is changed to 25 msec or 30 msec the delayed surround spots move to the right with respect to the center spots.
  - In case of no time delay ! (faulty condition) the surround spots fall just between 2 center markers spots (20 msec)
- **How to check with a double beam scope**

WARNING: Be sure that the ground connection (-) of each instrument is not connecteded with the safety earth ⊥ connection. To avoid damage to output amplifiers (balance type) Use only cinch (input) ground connection

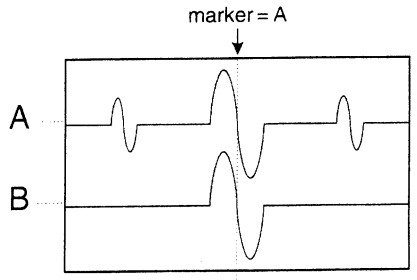
- Select Pro Logic mode "wide" or "normal" (phantom in case of no Center output.)
- Select 20 msec time delay in Surround channel.
- Adjust scope at 5 msec/division and trigger at A input
- Connect input A to Center channel (or L or R in case of phantom mode)
- Connect input B to Surround channel
- Adjust trigger level and the X position to set pulse A in the middle of the scope . see fig.2 (if L or R used in phantom mode choose the largest (amplitude) pulse. see fig 3

Select track 24:
Pulse A = 20 msec marker
Pulse B = delayed surround signal pulse



20 msec. time delay

Fig. 2

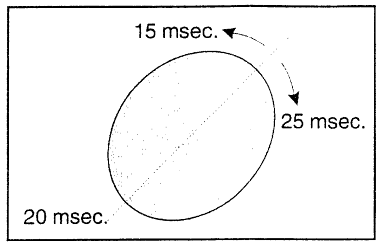


20 msec. in case of phantom mode

Fig. 3

Change time delay to 15 msec (only in versions with variable delay).
he surround pulse in channel B moves to the left with respect to side from center marker (channel A) position.
Change time delay to 25 or 30 msec (versions with variable delay).
The surround pulse in channel B moves to the right with respect to center marker (channel A) position.

Time delay with track 6
Alternative methode :
The functional operation of the time delay can be made visible with a lisajous figure, with an single beam scope.
Connect X-direction on Surround output
Connect Y-direction on Left or Right output/input.
Note : be careful and use only 1 ground connected to scope.
Select track 6 (surround test) :
Make the lisajous figure visible on the scope (amplitude adjust) see fig. 4



Lisajous out of phase
Time delay = OK

Fig. 4

Note : in sets with variable time delay the ellipse of the lisajous figure must be always open. Changing the time delay changes the direction of the circle accordingly.

ted and added to

ɔutput.
itted and added to

ɔ the L_t; R_t inputs

Ɽ$_t$ input (180°).

annel.
every 40 msec.

h respect to the

the right with

:ers spots (20

with the safety
ɜ only cinch

L or R used in

Change time delay to 15 msec (only in versions with variable delay).
he surround pulse in channel B moves to the left with respect to side from center marker (channel A) position.
Change time delay to 25 or 30 msec (versions with variable delay).
The surround pulse in channel B moves to the right with respect to center marker (channel A) position.

Time delay with track 6

Alternative methode :
The functional operation of the time delay can be made visible with a lisajous figure, with an single beam scope.
Connect X-direction on Surround output
Connect Y-direction on Left or Right output/input.
Note : be careful and use only 1 ground connected to scope.
Select track 6 (surround test) :
Make the lisajous figure visible on the scope (amplitude adjust) see fig. 4

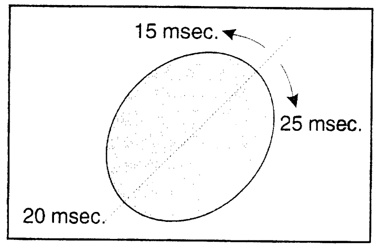

15 msec.
25 msec.
20 msec.

Fig. 4

Lisajous out of phase
Time delay = OK

Note : in sets with variable time delay the ellipse of the lisajous figure must be always open. Changing the time delay changes the direction of the circle accordingly.

Tone burst to check time delay in Surround channel

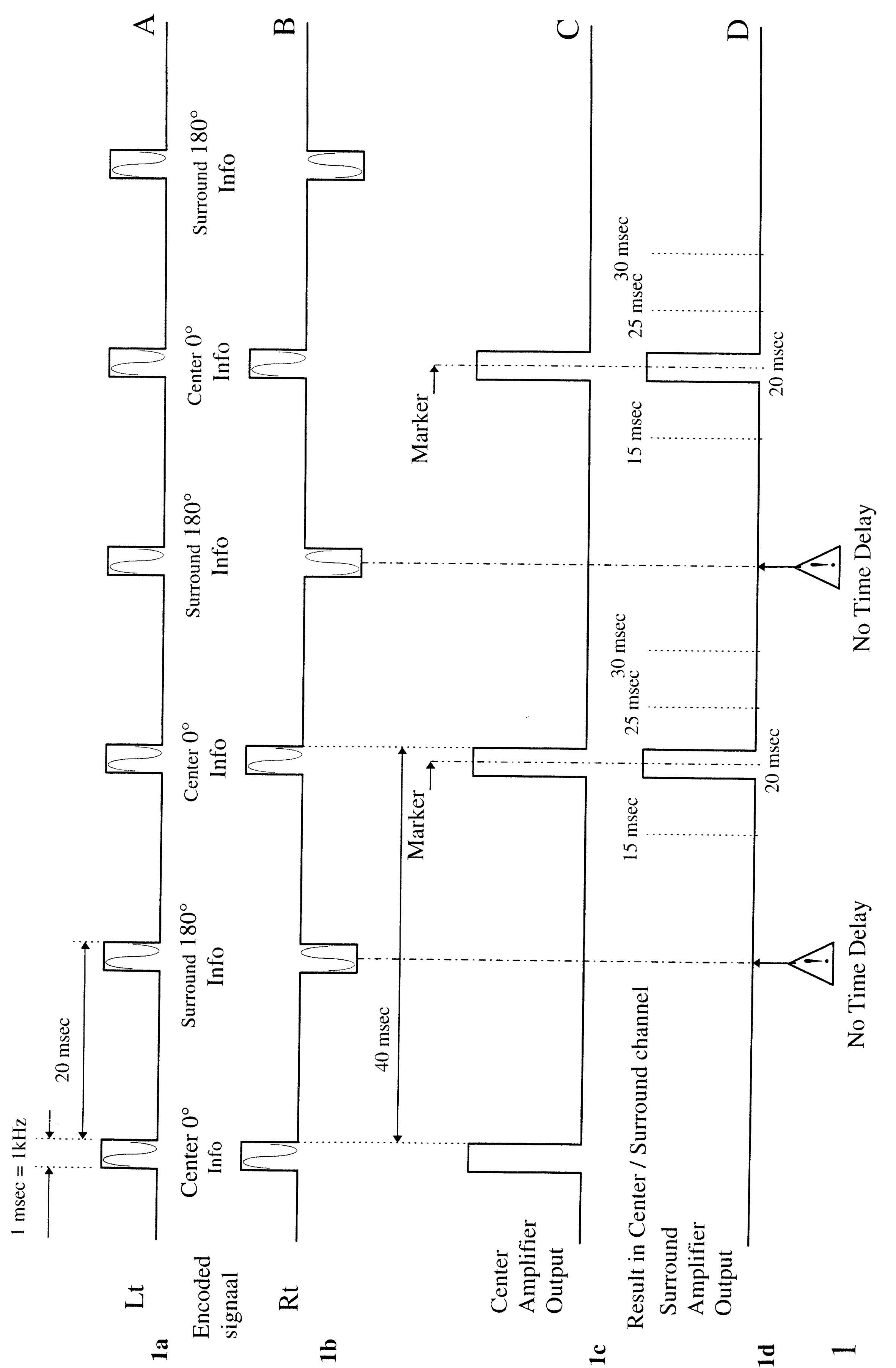
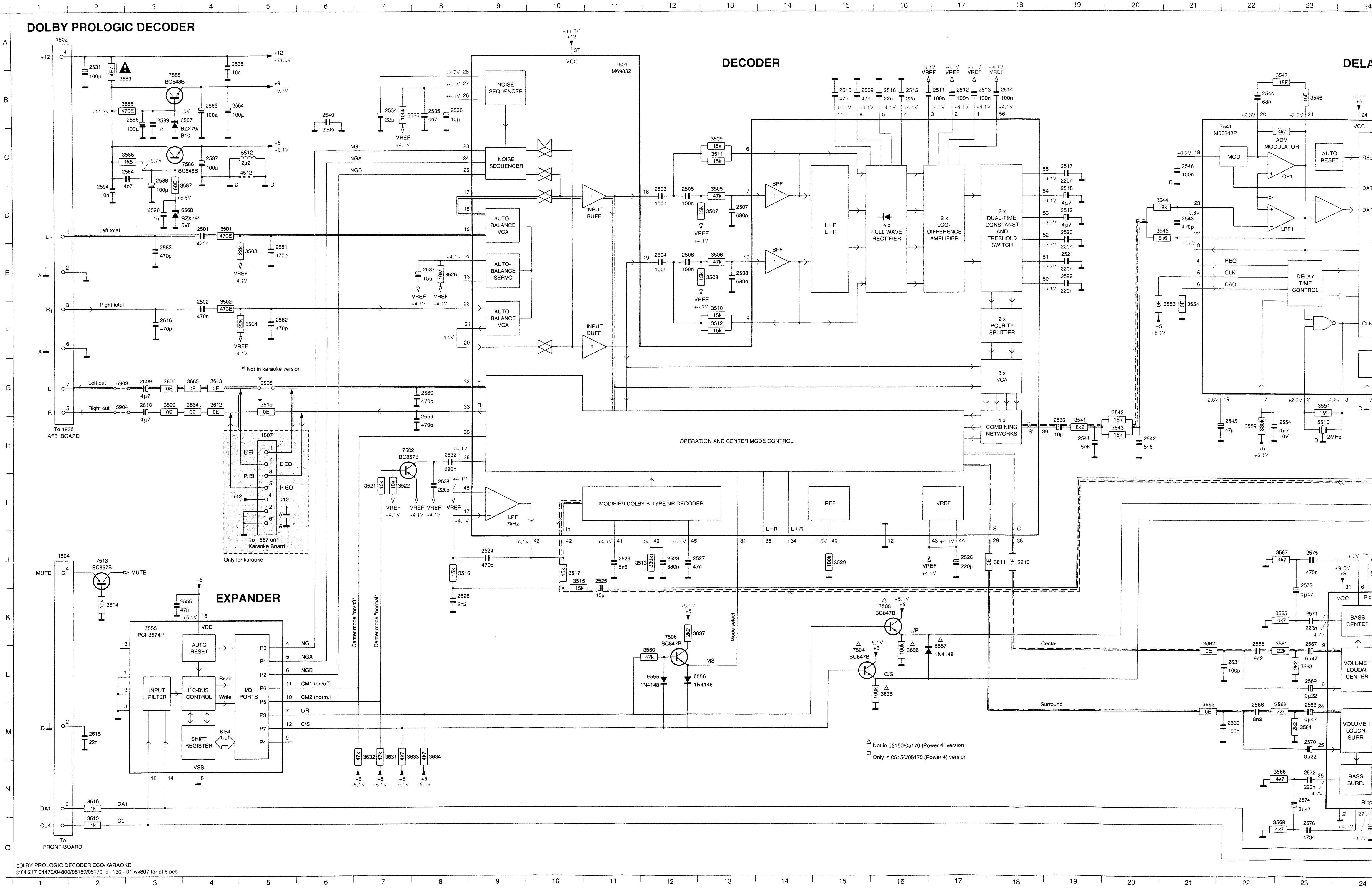
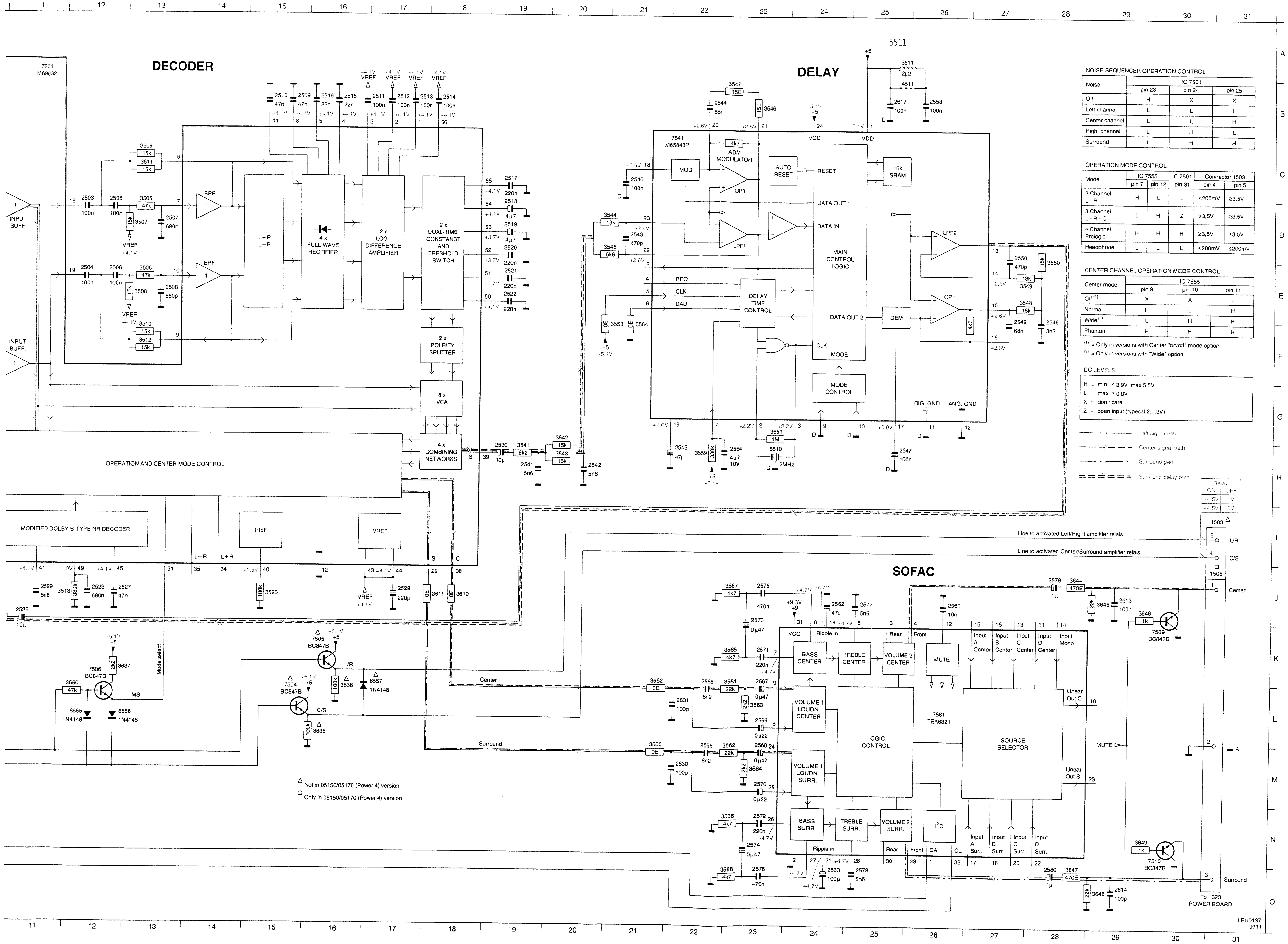

A
B
C
D
1 msec = 1kHz
20 msec
40 msec
Center 0° Info
Surround 180° Info
Marker
15 msec
20 msec
25 msec
30 msec
No Time Delay
Lt
Encoded signaal
Rt
Center Amplifier Output
Result in Center / Surround channel
Surround Amplifier Output
fig 1a
fig 1b
fig 1c
fig 1d

Fig 1


DOLBY PROLOGIC DECODER
DECODER
EXPANDER
NOISE SEQUENCER
AUTO-BALANCE VCA
AUTO-BALANCE SERVO
INPUT BUFF.
7501 M69032
BPF
L+R L−R
4 x FULL WAVE RECTIFIER
2 x LOG-DIFFERENCE AMPLIFIER
2 x DUAL-TIME CONSTANT AND TRESHOLD SWITCH
2 x POLRITY SPLITTER
8 x VCA
4 x COMBINING NETWORKS
OPERATION AND CENTER MODE CONTROL
MODIFIED DOLBY B-TYPE NR DECODER
IREF
VREF
LPF 7kHz
7555 PCF8574P
AUTO RESET
INPUT FILTER
I²C-BUS CONTROL
SHIFT REGISTER
I/O PORTS
7541 M65843P
MOD
ADM MODULATOR
AUTO RESET
DELAY TIME CONTROL
BASS CENTER
VOLUME LOUDN. CENTER
VOLUME LOUDN. SURR.
BASS SURR.
Left total
Right total
Left out
Right out
To 1835 AF3 BOARD
To 1557 on Karaoke Board
Only for karaoke
* Not in karaoke version
To FRONT BOARD
MUTE
DA1
CLK
Center
Surround
Mode select
Center mode "on/off"
Center mode "normal"
△ Not in 05150/05170 (Power 4) version
□ Only in 05150/05170 (Power 4) version
DOLBY PROLOGIC DECODER ECO/KARAOKE
3104 217 04470/04800/05150/05170 bl. 130 - 01 wk807 for pt 6 pcb


DECODER
7501
M69032
INPUT BUFF.
BPF
L+R
L−R
4 x FULL WAVE RECTIFIER
2 x LOG-DIFFERENCE AMPLIFIER
2 x DUAL-TIME CONSTANT AND TRESHOLD SWITCH
2 x POLRITY SPLITTER
8 x VCA
4 x COMBINING NETWORKS
OPERATION AND CENTER MODE CONTROL
MODIFIED DOLBY B-TYPE NR DECODER
IREF
VREF
DELAY
7541
M65843P
MOD
ADM MODULATOR
OP1
AUTO RESET
16k SRAM
RESET
DATA OUT 1
DATA IN
LPF1
LPF2
MAIN CONTROL LOGIC
DELAY TIME CONTROL
REQ
CLK
DAD
DATA OUT 2
DEM
MODE
MODE CONTROL
DIG. GND
ANG. GND
2MHz
5511
SOFAC
7561
TEA6321
BASS CENTER
TREBLE CENTER
VOLUME 2 CENTER
MUTE
VOLUME 1 LOUDN. CENTER
LOGIC CONTROL
SOURCE SELECTOR
VOLUME 1 LOUDN. SURR.
BASS SURR.
TREBLE SURR.
VOLUME 2 SURR.
I²C
Ripple in
Rear
Front
Input A Center
Input B Center
Input C Center
Input D Center
Input Mono
Input A Surr.
Input B Surr.
Input C Surr.
Input D Surr.
Linear Out C
Linear Out S
MUTE
Center
Surround
L/R
C/S
MS
Mode select
7504 BC847B
7505 BC847B
7506 BC847B
7509 BC847B
7510 BC847B
6555 1N4148
6556 1N4148
6557 1N4148
Line to activated Left/Right amplifier relais
Line to activated Center/Surround amplifier relais
1503
1505
To 1323 POWER BOARD
Relay
ON
OFF
+4.5V
0V
Left signal path
Center signal path
Surround path
Surround delay path
LEU0137
9711

△ Not in 05150/05170 (Power 4) version

□ Only in 05150/05170 (Power 4) version

NOISE SEQUENCER OPERATION CONTROL

Noise	IC 7501		
	pin 23	pin 24	pin 25
Off	H	X	X
Left channel	L	L	L
Center channel	L	L	H
Right channel	L	H	L
Surround	L	H	H

OPERATION MODE CONTROL

Mode	IC 7555		IC 7501	Connector 1503	
	pin 7	pin 12	pin 31	pin 4	pin 5
2 Channel L - R	H	L	L	≤200mV	≥3,5V
3 Channel L - R - C	L	H	Z	≥3,5V	≥3,5V
4 Channel Prologic	H	H	H	≥3,5V	≥3,5V
Headphone	L	L	L	≤200mV	≤200mV

CENTER CHANNEL OPERATION MODE CONTROL

Center mode	IC 7555		
	pin 9	pin 10	pin 11
Off (1)	X	X	L
Normal	H	L	H
Wide (2)	L	H	H
Phanton	H	H	H

(1) = Only in versions with Center "on/off" mode option

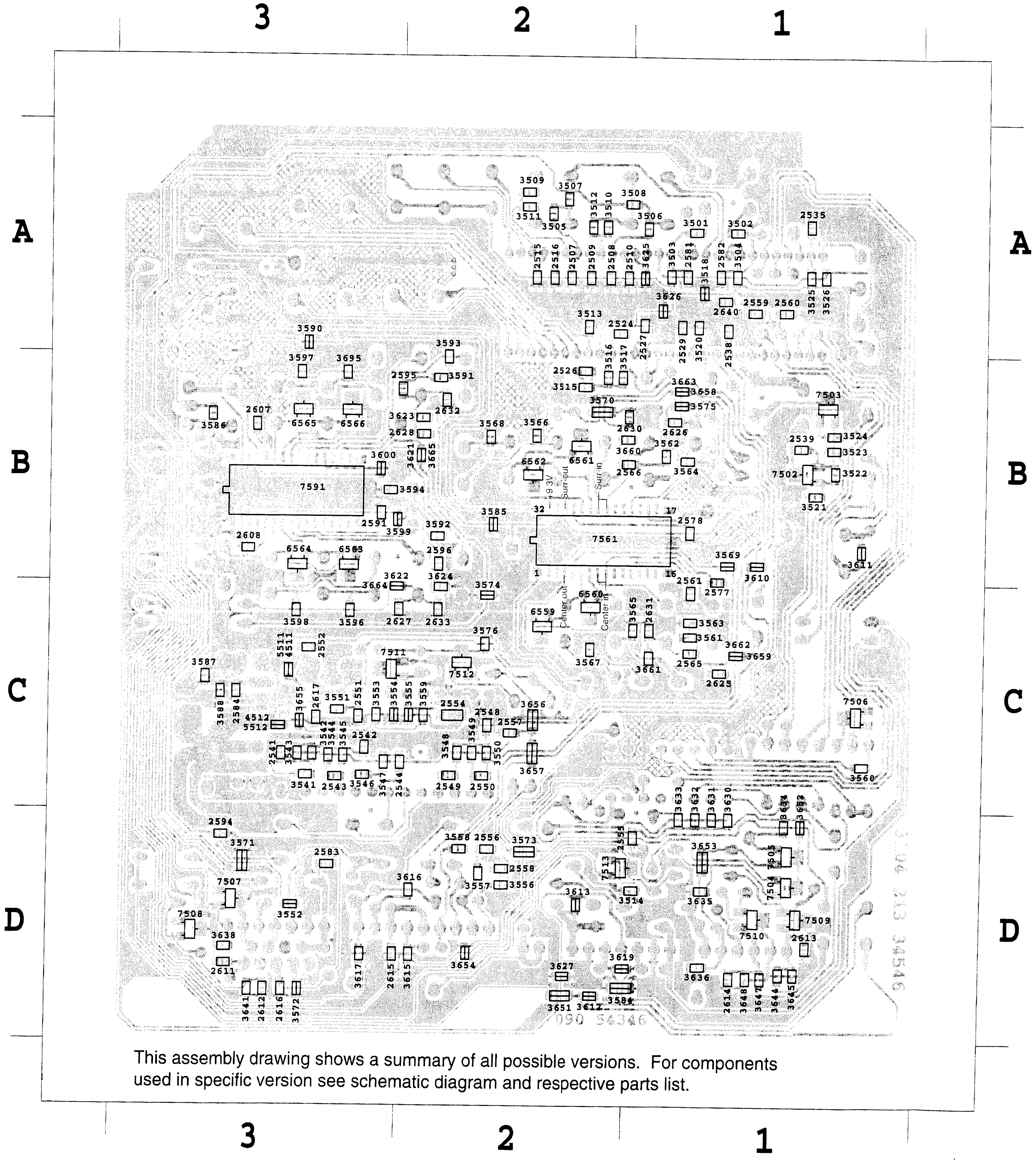
(2) = Only in versions with "Wide" option

DC LEVELS

H = min ≤ 3,9V max 5,5V
L = max ≥ 0,8V
X = don't care
Z = open input (typecal 2....3V)

1502	A1
1503	I30
1504	J1
1505	J30
1507	H5
2501	D4
2502	F4
2503	D12
2504	E12
2505	D12
2506	E12
2507	D13
2508	E13
2509	B15
2510	B15
2511	B17
2512	B17
2513	B17
2514	B18
2515	B16
2516	B16
2517	C19
2518	D19
2519	D19
2520	D19
2521	E19
2522	E19
2523	J12
2524	J9
2525	J11
2526	K8
2527	J12
2528	J17
2529	J11
2530	H19
2531	A2
2532	H8
2534	B7
2535	B8
2536	B8
2537	E8
2538	A4
2539	I8
2540	B6
2541	H19
2542	H20
2543	D21
2544	B22
2545	H22
2546	C21
2547	H25
2548	F28
2549	F27
2550	D27
2553	B26
2554	H23
2555	K4
2559	H8
2560	G8
2561	J26
2562	J24
2563	O24
2564	B4
2565	L22
2566	M22
2567	L23
2568	M23
2569	L23
2570	M23
2571	K23
2572	N23
2573	K23
2574	N23
2575	J23
2576	O23
2577	J25
2578	O25
2579	J28
2580	O28
2581	E5
2582	F5
2583	E3
2584	C2
2585	B4
2586	B3
2587	C4
2588	C3
2589	B3
2590	D3
2594	D2
2609	G3
2610	G3
2613	J29
2614	O29
2615	M2
2616	F3
2617	B25
2630	M22
2631	L22
3501	D4
3502	F4
3503	E5
3504	F5
3505	D13
3506	E13
3507	D13
3508	E13
3509	C13
3510	F13
3511	C13
3512	F13
3513	J11
3514	K2
3515	J10
3516	J8
3517	J10
3520	J15
3521	I7
3522	I7
3525	B7
3526	E8
3541	H19
3542	H20
3543	H20
3544	D20
3545	D20
3546	B23
3547	B22
3548	E27
3549	E27
3550	E28
3551	G23
3553	F21
3554	F21
3559	H22
3560	L12
3561	L22
3562	M22
3563	L23
3564	M23
3565	K22
3566	N22
3567	J22
3568	O22
3586	B2
3587	D3
3588	C2
3589	B2
3599	G3
3600	G3
3610	J18
3611	J18
3612	G4
3613	G4
3615	O2
3616	N2
3619	G5
3631	N7
3632	N7
3633	N7
3634	N8
3635	L16
3636	L16
3637	K12
3644	J28
3645	J29
3646	J29
3647	O28
3648	O29
3649	N29
3662	L21
3663	M21
3664	G4
3665	G4
4511	B25
4512	C5
5510	H23
5511	A25
5512	C5
5903	G2
5904	G2
6555	L12
6556	L12
6557	L17
6567	B3
6568	D3
7501	A11
7502	H7
7504	L15
7505	K16
7506	K12
7509	K30
7510	N30
7513	J2
7541	C21
7555	K3
7561	L26
7585	B3
7586	C3
9505	G5

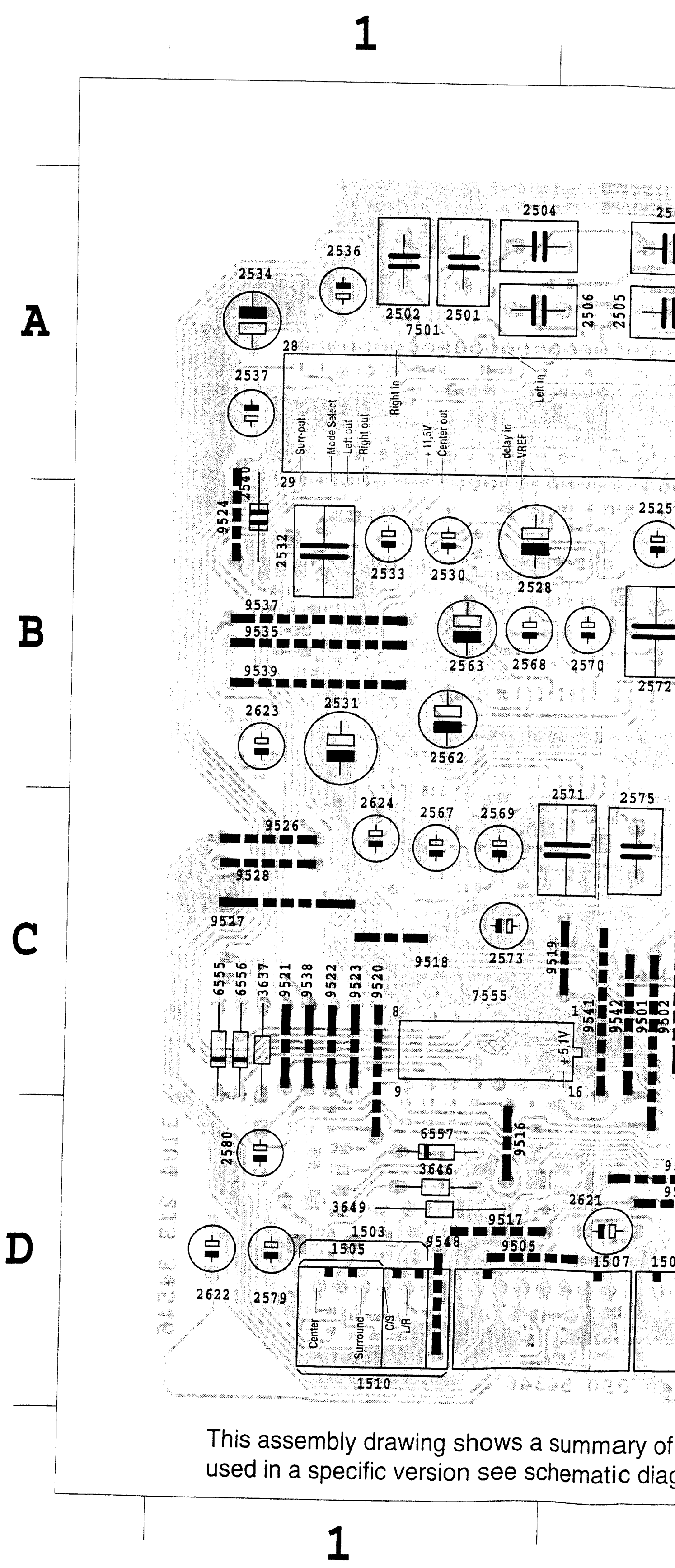
CHIP LAYOUT


3
2
1
A
B
C
D
7591
7561
9.3V
Surr out
Surr in
Center out
Center in
7511
7512
3 2 1

This assembly drawing shows a summary of all possible versions. For components used in specific version see schematic diagram and respective parts list.

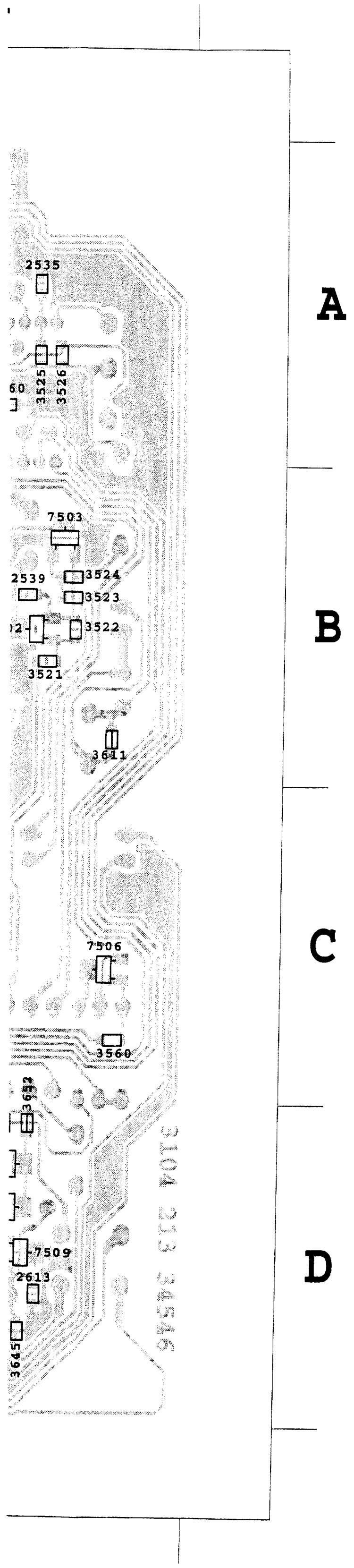
2507	A	2
2508	A	2
2509	A	2
2510	A	2
2515	A	2
2516	A	2
2524	A	2
2526	B	2
2527	A	1
2529	A	1
2535	A	1
2538	A	1
2539	B	1
2541	C	3
2542	C	3
2543	C	3
2544	C	2
2548	C	2
2549	C	2
2550	C	2
2551	C	3
2552	C	3
2554	C	2
2555	D	1
2556	D	2
2557	C	2
2558	D	2
2559	A	1
2560	A	1
2561	C	1
2565	C	1
2566	B	2
2577	B	1
2578	B	1
2581	A	1
2582	A	1
2583	D	3
2584	C	3
2591	B	3
2594	D	3
2595	B	3
2596	B	2
2607	B	3
2608	B	3
2611	D	3
2612	D	3
2613	D	1
2614	D	1
2615	D	3
2616	D	3
2617	C	3
2625	C	1
2626	B	1
2627	C	3
2628	B	2
2630	B	2
2631	C	1
2632	B	2
2633	C	2
2640	A	1
3501	A	1
3502	A	1
3503	A	1
3504	A	1
3505	A	2
3506	A	1
3507	A	2
3508	A	2
3509	A	2
3510	A	2
3511	A	2
3512	A	2
3513	A	2
3514	D	1
3515	B	2
3516	B	2
3517	B	2
3518	A	1
3520	A	1
3521	B	1
3522	B	1
3523	B	1
3524	B	1
3525	A	1
3526	A	1
3541	C	3
3542	C	3
3543	C	3
3544	C	3
3545	C	3
3546	C	3
3547	C	3
3548	C	2
3549	C	2
3550	C	2
3551	C	3
3552	D	3
3553	C	3
3554	C	3
3555	C	2
3556	D	2
3557	D	2
3558	D	2
3559	C	2
3560	C	1
3561	C	1
3562	B	1
3563	C	1
3564	B	1
3565	C	1
3566	B	2
3567	C	2
3568	B	2
3569	B	1
3570	B	2
3571	D	3
3572	D	3
3573	D	2
3574	C	2
3575	B	1
3576	C	2
3584	D	2
3585	B	2
3586	B	3
3587	C	3
3588	C	3
3590	A	3
3591	B	2
3592	B	2
3593	B	2
3594	B	3
3596	C	3
3597	B	3
3598	C	3
3599	B	3
3600	B	3
3610	B	1
3611	B	1
3612	D	2
3613	D	2
3615	D	2
3616	D	2
3617	D	3
3619	D	2
3621	B	2
3622	C	3
3623	B	2
3624	C	2
3625	A	1
3626	A	1
3627	D	2
3630	D	1
3631	D	1
3632	D	1
3633	D	1
3634	D	1
3635	D	1
3636	D	1
3638	D	3
3641	D	3
3644	D	1
3645	D	1
3647	D	1
3648	D	1
3651	D	2
3652	D	1
3653	D	1
3654	D	2
3655	C	3
3656	C	2
3657	C	2
3658	B	1
3659	C	1
3660	B	2
3661	C	1
3662	C	1
3663	B	1
3664	C	3
3665	B	2
3695	B	3
4511	C	3
4512	C	3
5511	C	3
5512	C	3
6559	C	2
6560	C	2
6561	B	2
6562	B	2
6563	B	3
6564	B	3
6565	B	3
6566	B	3
7502	B	1
7503	B	1
7504	D	1
7505	D	1
7506	C	1
7507	D	3
7508	D	3
7509	D	1
7510	D	1
7511	C	3
7512	C	2
7513	D	2
7561	B	2
7591	B	3

COMPONENT LAYOUT

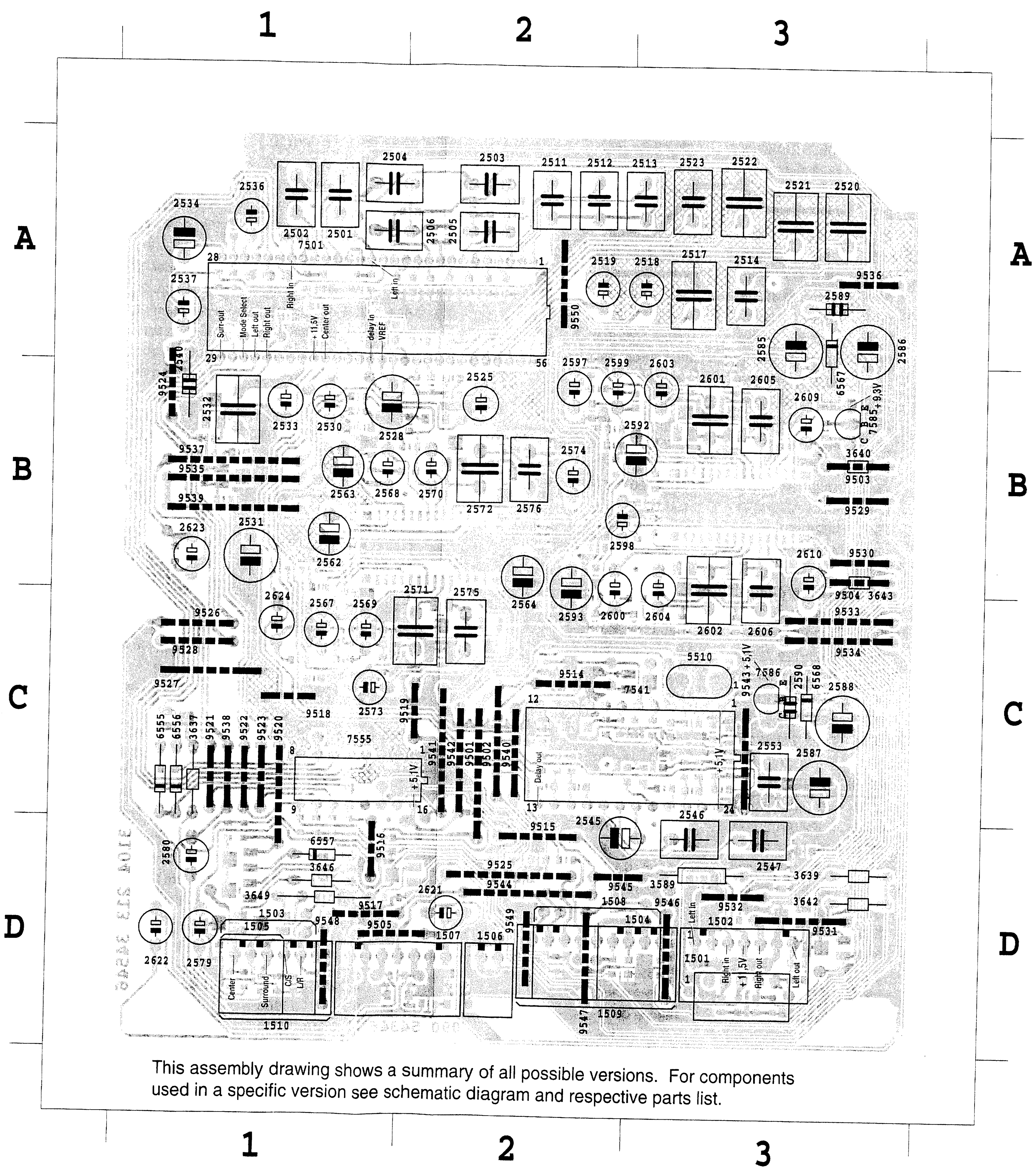

1
A
B
C
D
7501
7555
Surr out
Mode Select
Left out
Right out
Right In
+11.5V
Center out
delay in
VREF
Left in
+5.1V
Center
Surround
C/S
L/R
1505
1510

This assembly drawing shows a summary of
used in a specific version see schematic diag

COMPONENT LAYOUT


A
B
C
D
2535
3525
3526
7503
2539
3524
3523
3522
3521
3611
7506
3560
3652
7509
2613
3645
3104 213 3454 6

2507	A	2	2633	C	2	3572	D	3	3661	C	1
2508	A	2	2640	A	1	3573	D	2	3662	C	1
2509	A	2	3501	A	1	3574	C	2	3663	B	1
2510	A	2	3502	A	1	3575	B	1	3664	C	3
2515	A	2	3503	A	1	3576	C	2	3665	B	2
2516	A	2	3504	A	1	3584	D	2	3695	B	3
2524	A	2	3505	A	2	3585	B	2	4511	C	3
2526	B	2	3506	A	1	3586	B	3	4512	C	3
2527	A	1	3507	A	2	3587	C	3	5511	C	3
2529	A	1	3508	A	2	3588	C	3	5512	C	3
2535	A	1	3509	A	2	3590	A	3	6559	C	2
2538	A	1	3510	A	2	3591	B	2	6560	C	2
2539	B	1	3511	A	2	3592	B	2	6561	B	2
2541	C	3	3512	A	2	3593	B	2	6562	B	2
2542	C	3	3513	A	2	3594	B	3	6563	B	3
2543	C	3	3514	D	1	3596	C	3	6564	B	3
2544	C	2	3515	B	2	3597	B	3	6565	B	3
2548	C	2	3516	B	2	3598	C	3	6566	B	3
2549	C	2	3517	B	2	3599	B	3	7502	B	1
2550	C	2	3518	A	1	3600	B	3	7503	B	1
2551	C	3	3520	A	1	3610	B	1	7504	D	1
2552	C	3	3521	B	1	3611	B	1	7505	D	1
2554	C	2	3522	B	1	3612	D	2	7506	C	1
2555	D	1	3523	B	1	3613	D	2	7507	D	3
2556	D	2	3524	B	1	3615	D	2	7508	D	3
2557	C	2	3525	A	1	3616	D	2	7509	D	1
2558	D	2	3526	A	1	3617	D	3	7510	D	1
2559	A	1	3541	C	3	3619	D	2	7511	C	3
2560	A	1	3542	C	3	3621	B	2	7512	C	2
2561	C	1	3543	C	3	3622	C	3	7513	D	2
2565	C	1	3544	C	3	3623	B	2	7561	B	2
2566	B	2	3545	C	3	3624	C	2	7591	B	3
2577	B	1	3546	C	3	3625	A	1			
2578	B	1	3547	C	3	3626	A	1			
2581	A	1	3548	C	2	3627	D	2			
2582	A	1	3549	C	2	3630	D	1			
2583	D	3	3550	C	2	3631	D	1			
2584	C	3	3551	C	3	3632	D	1			
2591	B	3	3552	D	3	3633	D	1			
2594	D	3	3553	C	3	3634	D	1			
2595	B	3	3554	C	3	3635	D	1			
2596	B	2	3555	C	2	3636	D	1			
2607	B	3	3556	D	2	3638	D	3			
2608	B	3	3557	D	2	3641	D	3			
2611	D	3	3558	D	2	3644	D	1			
2612	D	3	3559	C	2	3645	D	1			
2613	D	1	3560	C	1	3647	D	1			
2614	D	1	3561	C	1	3648	D	1			
2615	D	3	3562	B	1	3651	D	2			
2616	D	3	3563	C	1	3652	D	1			
2617	C	3	3564	B	1	3653	D	1			
2625	C	1	3565	C	1	3654	D	2			
2626	B	1	3566	B	2	3655	C	3			
2627	C	3	3567	C	2	3656	C	2			
2628	B	2	3568	B	2	3657	C	2			
2630	B	2	3569	B	1	3658	B	1			
2631	C	1	3570	B	2	3659	C	1			
2632	B	2	3571	D	3	3660	B	2			


1
2
3
A
B
C
D
2504
2503
2511
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2536
2534
2502
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7501
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28
1
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2518
2517
2514
2537
Surr out
Mode Select
Left out
Right out
Right in
+11,5V
Center out
delay in
VREF
Left in
9550
9536
2589
2585
6567
2586
29
56
2597
2599
2603
2601
2605
2609
7585
+9,3V
9524
2540
2532
2533
2530
2528
2525
2592
3640
9503
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9504
3643
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2593
2600
2604
2602
2606
9533
9534
9528
5510
9543 +5,1V
7586
2590
6568
2588
9514
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9527
2573
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12
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3637
9521
9538
9522
9523
9520
7555
8
+5,1V
9511
9542
9501
9502
9540
Delay out
+5,1V
2553
2587
9
16
13
24
2546
2580
6557
3646
9516
9515
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3649
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1503
9548
1505
9505
1507
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9549
1508
9546
1504
9532
3642
9531
1502
1501
Center
Surround
C/S
L/R
1510
9547
1509
Right in
+11,5V
Right out
Left out
2622
2579

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

1501	D	3	2587	C	3	9527	C	1
1502	D	3	2588	C	3	9528	C	1
1503	D	1	2589	A	3	9529	B	3
1504	D	3	2590	C	3	9530	B	3
1505	D	1	2592	B	3	9531	D	3
1506	D	2	2593	B	2	9532	D	3
1507	D	2	2597	B	2	9533	C	3
1508	D	2	2598	B	2	9534	C	3
1509	D	2	2599	B	2	9535	B	1
1510	D	1	2600	B	2	9536	A	3
2501	A	1	2601	B	3	9537	B	1
2502	A	1	2602	B	3	9538	C	1
2503	A	2	2603	B	3	9539	B	1
2504	A	1	2604	B	3	9540	C	2
2505	A	2	2605	B	3	9541	C	2
2506	A	1	2606	B	3	9542	C	2
2511	A	2	2609	B	3	9543	C	3
2512	A	2	2610	B	3	9544	D	2
2513	A	3	2621	D	2	9545	D	2
2514	A	3	2622	D	1	9546	D	3
2517	A	3	2623	B	1	9547	D	2
2518	A	3	2624	C	1	9548	D	1
2519	A	2	3589	D	3	9549	D	2
2520	A	3	3637	C	1	9550	A	2
2521	A	3	3639	D	3			
2522	A	3	3640	B	3			
2523	A	3	3642	D	3			
2525	B	2	3643	B	3			
2528	B	1	3646	D	1			
2530	B	1	3649	D	1			
2531	B	1	5510	C	3			
2532	B	1	6555	C	1			
2533	B	1	6556	C	1			
2534	A	1	6557	D	1			
2536	A	1	6567	A	3			
2537	A	1	6568	C	3			
2540	B	1	7501	A	1			
2545	D	2	7541	C	3			
2546	D	3	7555	C	1			
2547	D	3	7585	B	3			
2553	C	3	7586	C	3			
2562	B	1	9501	C	2			
2563	B	1	9502	C	2			
2564	B	2	9503	B	3			
2567	C	1	9504	B	3			
2568	B	1	9505	D	1			
2569	C	1	9514	C	2			
2570	B	2	9515	D	2			
2571	C	2	9516	D	1			
2572	B	2	9517	D	1			
2573	C	1	9519	C	2			
2574	B	2	9520	C	1			
2575	C	2	9521	C	1			
2576	B	2	9522	C	1			
2579	D	1	9523	C	1			
2580	D	1	9524	B	1			
2585	A	3	9525	D	2			
2586	A	3	9526	C	1			

CAPACITORS

2501	4822 121 51252	470nF 5% 63V
2502	4822 121 51252	470nF 5% 63V
2503	5322 121 42386	100nF 5% 63V
2504	5322 121 42386	100nF 5% 63V
2505	5322 121 42386	100nF 5% 63V
2506	5322 121 42386	100nF 5% 63V
2507	4822 122 32535	680pF 10% 63V
2508	4822 122 32535	680pF 10% 63V
2509	4822 126 12944	47nF 10% 50V
2510	4822 126 12944	47nF 10% 50V
2511	5322 121 42386	100nF 5% 63V
2512	5322 121 42386	100nF 5% 63V
2513	5322 121 42386	100nF 5% 63V
2514	5322 121 42386	100nF 5% 63V
2515	5322 122 32654	22nF 10% 63V
2516	5322 122 32654	22nF 10% 63V
2517	4822 121 42408	220nF 5% 63V
2518	4822 124 40246	4,7µF 20% 63V
2519	4822 124 40246	4,7µF 20% 63V
2520	4822 121 42408	220nF 5% 63V
2521	4822 121 42408	220nF 5% 63V
2522	4822 121 42408	220nF 5% 63V
2523	5322 121 42498	680nF 5% 63V
2524	5322 122 34099	470pF 10% 63V
2525	4822 124 41579	10µF 20% 50V
2526	4822 122 33175	2,2nF 20% 50V
2527	4822 126 12944	47nF 10% 50V
2528	4822 124 40196	220µF 20% 16V
2529	4822 122 32646	5,6nF 10% 50V
2530	4822 124 41579	10µF 20% 50V
2531	4822 124 81029	100µF 20% 25V
2532	4822 121 42408	220nF 5% 63V
2534	4822 124 41596	22µF 20% 50V
2535	5322 126 10223	4,7nF 10% 63V
2536	4822 124 41579	10µF 20% 50V
2537	4822 124 41579	10µF 20% 50V
2538	4822 122 33177	10nF 10% 50V
2539	5322 126 10794	220pF 5% 63V
2540	4822 122 10466	220pF 10% 50V
2541	4822 122 32646	5,6nF 10% 50V
2542	4822 122 32646	5,6nF 10% 50V
2543	5322 122 34099	470pF 10% 63V
2544	4822 126 13805	68nF 10 16V
2545	4822 124 40433	47µF 20% 25V
2546	5322 121 42386	100nF 5% 63V
2547	5322 121 42386	100nF 5% 63V
2548	4822 122 33891	3,3nF 10% 63V
2549	4822 126 13805	68nF 10% 16V
2550	5322 122 34099	470pF 10% 63V
2553	5322 121 42386	100nF 5% 63V
2554	4822 126 14083	4,7µF +80/-20% 10V
2555	4822 126 12944	47nF 10% 50V
2559	5322 122 34099	470pF 10% 63V
2560	5322 122 34099	470pF 10% 63V
2561	4822 122 33177	10nF 20% 50V
2562	4822 124 40433	47µF 20% 25V
2563	4822 124 41584	100µF 20% 10V
2564	4822 124 41584	100µF 20% 10V
2565	4822 122 33336	8,2nF 10% 50V
2566	4822 122 33336	8,2nF 10% 50V
2567	4822 124 41407	0,47µF 20% 63V
2568	4822 124 41407	0,47µF 20% 63V
2569	4822 124 40746	0,22µF 20% 63V
2570	4822 124 40746	0,22µF 20% 63V
2571	4822 121 42408	220nF 5% 63V
2572	4822 121 42408	220nF 5% 63V
2573	4822 124 41407	0,47µF 20% 63V
2574	4822 124 41407	0,47µF 20% 63V
2575	4822 121 51252	470nF 5% 63V
2576	4822 121 51252	470nF 5% 63V
2577	4822 122 32646	5,6nF 10% 50V
2578	4822 122 32646	5,6nF 10% 50V
2579	4822 124 40242	1µF 20% 63V
2580	4822 124 40242	1µF 20% 63V
2581	5322 122 34099	470pF 10% 63V
2582	5322 122 34099	470pF 10% 63V
2583	5322 122 34099	470pF 10% 63V
2584	5322 126 10223	4,7nF 10% 63V
2585	4822 124 81029	100µF 20% 25V
2586	4822 124 81029	100µF 20% 25V
2587	4822 124 81029	100µF 20% 25V
2588	4822 124 81029	100µF 20% 25V
2589	4822 122 33197	1nF 10% 50V
2590	4822 122 33197	1nF 10% 50V
2594	4822 122 33177	10nF 10% 50V
2609	4822 124 40246	4,7µF 20% 63V
2610	4822 124 40246	4,7µF 20% 63V
2613	5322 122 32531	100pF 5% 50V
2614	5322 122 32531	100pF 5% 50V
2615	5322 122 32654	22nF 10% 63V
2616	5322 122 34099	470pF 10% 63V
2617	4822 126 13296	100nF 10% 16V
2630	5322 122 32531	100pF 5% 50V
2631	5322 122 32531	100pF 5% 50V

RESISTORS

3501	4822 051 20471	470R 5% 0,1W
3502	4822 051 20471	470R 5% 0,1W
3503	4822 051 20223	22k 5% 0,1W
3504	4822 051 20223	22k 5% 0,1W
3505	4822 051 20473	47k 5% 0,1W
3506	4822 051 20473	47k 5% 0,1W
3507	4822 051 20153	15k 5% 0,1W
3508	4822 051 20153	15k 5% 0,1W
3509	4822 051 20153	15k 5% 0,1W
3510	4822 051 20153	15k 5% 0,1W
3511	4822 051 20153	15k 5% 0,1W
3512	4822 051 20153	15k 5% 0,1W
3513	4822 051 20334	330k 5% 0,1W
3514	4822 117 10833	10k 1% 0,1W
3515	4822 051 20153	15k 5% 0,1W
3516	4822 051 20153	15k 5% 0,1W
3517	4822 051 20153	15k 5% 0,1W
3518	4822 051 20008	0R Jumper 0805
3520	4822 051 20104	100k 5% 0,1W
3521	4822 117 10833	10k 1% 0,1W
3522	4822 117 10833	10k 1% 0,1W
3525	4822 051 20104	100k 5% 0,1W
3526	4822 051 20106	10M 5% 0,1W
3541	4822 051 20822	8k2 5% 0,1W
3542	4822 051 20153	15k 5% 0,1W
3543	4822 051 20153	15k 5% 0,1W
3544	4822 051 20183	18k 5% 0,1W
3545	4822 051 20562	5k6 5% 0,1W
3546	4822 051 20159	15R 5% 0,1W
3547	4822 051 20159	15R 5% 0,1W
3548	4822 051 20153	15k 5% 0,1W
3549	4822 051 20183	18k 5% 0,1W
3550	4822 051 20153	15k 5% 0,1W
3551	4822 051 20105	1M 5% 0,1W
3552	4822 051 20008	0R Jumper 0805
3553	4822 051 20008	0R Jumper 0805
3554	4822 051 20008	0R Jumper 0805
3559	4822 051 20334	330k 5% 0,1W
3560	4822 051 20473	47k 5% 0,1W
3561	4822 051 20223	22k 5% 0,1W
3562	4822 051 20223	22k 5% 0,1W
3563	4822 117 11449	2k2 1% 0,1W
3564	4822 117 11449	2k2 1% 0,1W
3565	4822 051 20472	4k7 5% 0,1W
3566	4822 051 20472	4k7 5% 0,1W
3567	4822 051 20472	4k7 5% 0,1W
3568	4822 051 20472	4k7 5% 0,1W
3570	4822 051 10008	0R Jumper 1206
3571	4822 051 10008	0R Jumper 1206
3572	4822 051 20008	0R Jumper 0805
3573	4822 051 10008	0R Jumper 1206
3574	4822 051 20008	0R Jumper 0805
3584	4822 051 10008	0R Jumper 1206
3585	4822 051 20008	0R Jumper 0805
3586	4822 051 20471	470R 5% 0,1W
3587	4822 051 20689	68R 5% 0,1W
3588	4822 117 11139	1k5 1% 0,1W
3589	4822 052 10478	⚠ 4R7 5% 0,33W
3590	4822 051 20008	0R Jumper 0805
3599	4822 051 20008	0R Jumper 0805
3600	4822 051 20008	0R Jumper 0805
3610	4822 051 20008	0R Jumper 0805
3611	4822 051 20008	0R Jumper 0805
3612	4822 051 20008	0R Jumper 0805
3613	4822 051 20008	0R Jumper 0805
3615	4822 051 10102	1k 2% 0,25W
3616	4822 051 10102	1k 2% 0,25W
3619	4822 051 20008	0R Jumper 0805
3625	4822 051 20008	0R Jumper 0805
3626	4822 051 20008	0R Jumper 0805
3627	4822 051 20008	0R Jumper 0805
3631	4822 051 20473	47k 5% 0,1W
3632	4822 051 20473	47k 5% 0,1W
3633	4822 051 20472	4k7 5% 0,1W
3634	4822 051 20472	4k7 5% 0,1W
3635	4822 051 20104	100k 5% 0,1W
3636	4822 051 20104	100k 5% 0,1W
3637	4822 116 52256	2k2 5% 0,5W
3644	4822 051 20471	470R 5% 0,1W
3645	4822 051 20223	22k 5% 0,1W
3646	4822 050 11002	1k 1% 0,4W
3647	4822 051 20471	470R 5% 0,1W
3648	4822 051 20223	22k 5% 0,1W
3649	4822 050 11002	1k 1% 0,4W
3651	4822 051 10008	0R Jumper 1206
3652	4822 051 20008	0R Jumper 0805)
3653	4822 051 10008	0R Jumper 1206
3654	4822 051 20008	0R Jumper 0805
3655	4822 051 20008	0R Jumper 0805
3656	4822 051 10008	0R Jumper 1206
3657	4822 051 10008	0R Jumper 1206
3662	4822 051 20008	0R Jumper 0805
3663	4822 051 20008	0R Jumper 0805
3664	4822 051 20008	0R Jumper 0805
3665	4822 051 20008	0R Jumper 0805
5465	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5510	4822 242 81525	Ceram Resonator 2MHz
5511	4822 157 10586	Coil 2,2µH 10%
5512	4822 157 10586	Coil 2,2µH 10%

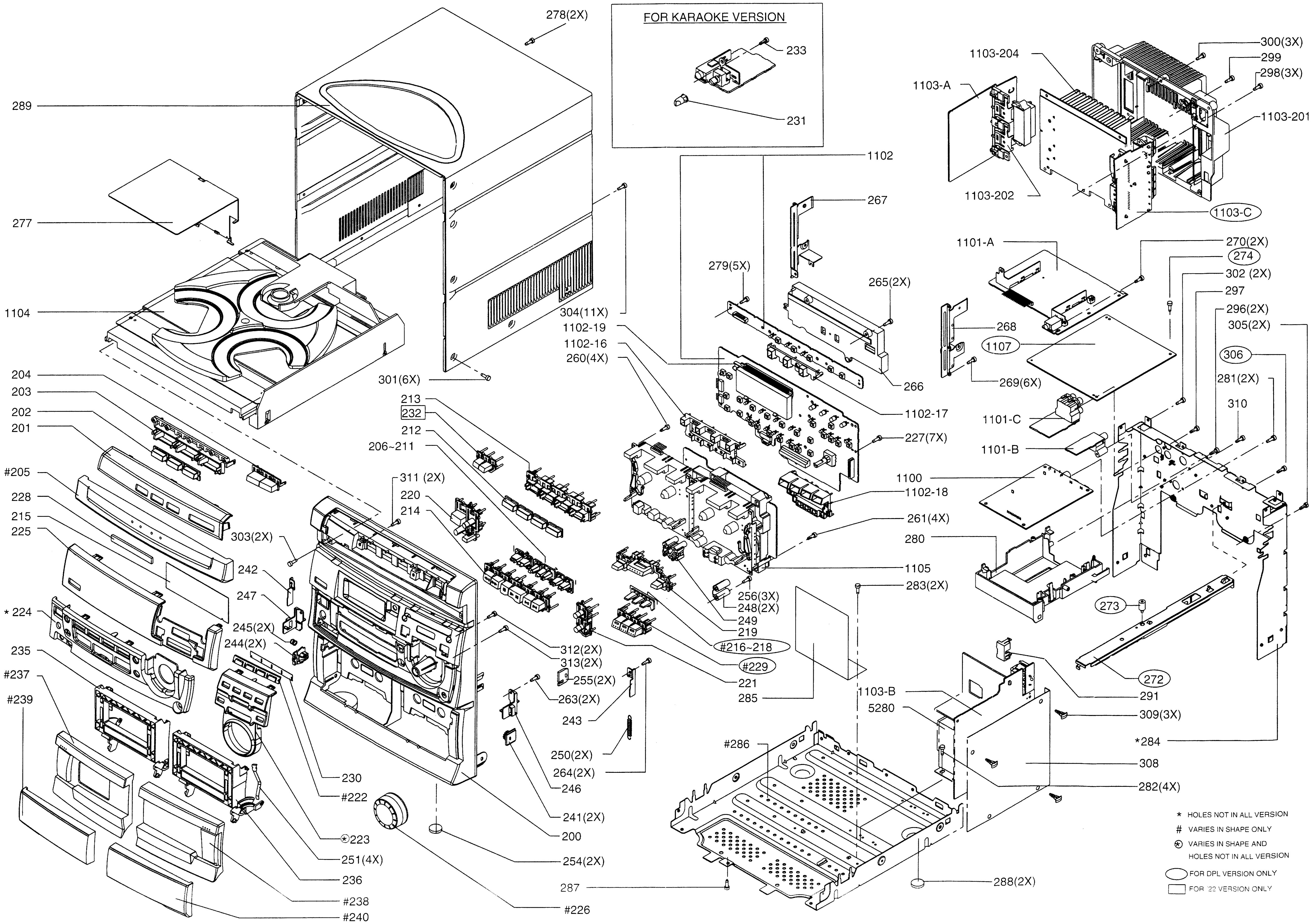
DIODES

6555	4822 130 30621	1N4148
6556	4822 130 30621	1N4148
6557	4822 130 30621	1N4148
6567	4822 130 61219	BZX79-B10
6568	4822 130 34173	BZX79-C5V6

TRANSISTORS & INTEGRATED CIRCUITS

7501	4822 209 12986	M69032P
7502	5322 130 60508	BC857B
7504	5322 130 60511	BC847B
7505	5322 130 60511	BC847B
7506	5322 130 60511	BC847B
7509	5322 130 60511	BC847B
7510	5322 130 60511	BC847B
7513	5322 130 60508	BC857B
7541	4822 209 15107	M65843AP
7555	5322 209 10883	PCF8574P
7561	4822 209 33652	TEA6321T/V1
7585	4822 130 40937	BC548B
7586	4822 130 40937	BC548B

NOTE: Only the parts mentioned in this list are normal service spare parts.


278(2X)
FOR KARAOKE VERSION
233
231
289
277
1104
204
203
202
201
#205
228
215
225
* 224
235
#237
#239
303(2X)
242
247
245(2X)
244(2X)
230
#222
⊛223
251(4X)
236
#238
#240
#226
311 (2X)
220
214
213
232
212
206~211
301(6X)
304(11X)
1102-19
1102-16
260(4X)
200
254(2X)
241(2X)
246
264(2X)
250(2X)
243
263(2X)
255(2X)
313(2X)
312(2X)
221
#229
#216~218
219
249
248(2X)
256(3X)
285
1102
267
279(5X)
265(2X)
266
1102-17
227(7X)
1102-18
261(4X)
1105
283(2X)
1103-204
1103-A
1103-202
300(3X)
299
298(3X)
1103-201
1103-C
1101-A
270(2X)
274
302 (2X)
297
296(2X)
305(2X)
268
1107
269(6X)
306
281(2X)
310
1101-C
1101-B
1100
280
273
272
291
1103-B
5280
309(3X)
*284
308
282(4X)
#286
287
288(2X)

* HOLES NOT IN ALL VERSION

# VARIES IN SHAPE ONLY

⊛ VARIES IN SHAPE AND HOLES NOT IN ALL VERSION

○ FOR DPL VERSION ONLY

☐ FOR '22 VERSION ONLY

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

200	4822 459 04889	Cabinet Front
201	4822 450 10442	Window CDC
202	4822 410 11645	Button Set CDC
203	4822 464 10372	Frame Button Set CDC
204	4822 410 11646	Button Set Open/Close
205	4822 442 01299	Cover Tray CDC
205	4822 442 01271	Cover Tray CDC ..W/37
212	4822 410 11647	Button Set Source Select
213	4822 464 10373	Frame Button Source Select
214	4822 410 11648	Button Set Control
219	4822 410 11745	Button Set DSC 2
220	4822 410 11651	Button Set Power
221	4822 410 11652	Button Set PRPG/HSD
223	4822 426 10611	Panel Control DPL2
224	4822 454 13297	Orn Display DPL
224	4822 454 13341	Orn Display DPL /21
225	4822 450 10479	Window Display /22/34
225	4822 450 10514	Window Display /21
225	4822 450 10481	Window Display ..W/22
225	4822 450 10548	Window Display ..W/37
226	4822 410 11653	Knob Volume
228	4822 454 13035	Badge Philips
228	4822 454 13265	Badge (PH-MAG) ..W/37
229	4822 410 11746	Button Set DPL 2
231	4822 410 11595	Knob Karaoke
232	4822 410 11698	Button RDS/NEWS
235	4822 443 10488	Door Cassette Right
236	4822 443 10487	Door Cassette Left
237	4822 442 01301	Cover Cassette Left
238	4822 442 01302	Cover Cassette Right
239	4822 381 11941	Lens Cassette Left
240	4822 381 11942	Lens Cassette Right
241	4822 529 10322	Damper Assembly
244	4822 402 10621	Push-Catch
245	4822 492 11344	Spring Compression
250	4822 492 11345	Spring Tension
251	4822 492 42787	Spring Cassette
254	4822 462 40683	Plate (Foot)
288	4822 462 40683	Plate (Foot)
289	4822 426 10574	Cabinet Rear
290	4822 450 10429	Window CDC
291	4822 402 10288	Bracket Mains Socket
309	4822 466 93148	Spacer 5mm
349	4822 445 10704	Center Speaker /21/22/34
349	4822 445 10705	Surround Speaker /21/22/34

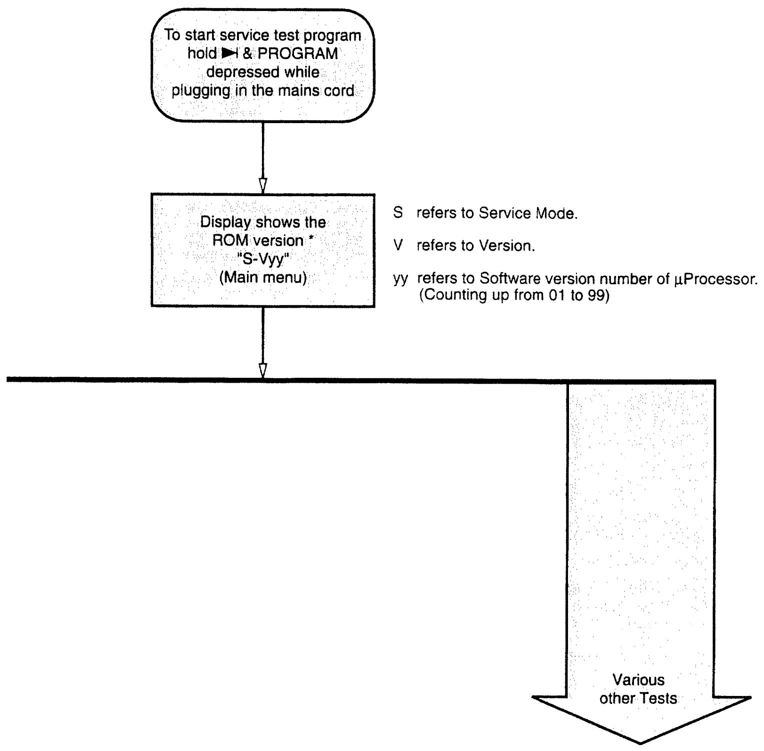
350	4822 445 10754		LS Pair To Single
350	4822 445 10726		LS Pair To Single ..W/37
351	4822 303 50063		FM Aerial
351	4822 320 11094		FM Aerial ..W/37
356	4822 219 10457		Remote Control
356	4822 219 10447		Remote Control ..W/37
384	4822 303 50082		AM Frame Aerial
385	4822 321 10249	⚠	Mains Cord
385	4822 321 10882	⚠	Mains Cord ..W/37
387	4822 736 15982		Instruction For Use /22
387	4822 736 16129		Instruction For Use /21
387	4822 736 16246		Instruction For Use /34
387	4822 73615983		Instruction For Use ..W/22
387	4822 736 16247		Instruction For Use ..W/37
5280	4822 146 10728	⚠	Mains Transformer
5280	4822 146 10755	⚠	Mains Transformer /21
5280	4822 146 10746	⚠	Mains Transformer ..W/37

Note : Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

227	D3 x 12
233	D3 x 12
256	D3 x 30
260	D3 x 12
261	D3 x 30
263	D3 x 12
264	D3 x 12
265	D3 x 12
269	D3 x 12
270	D3 x 10
274	D3 x 16
274	M3 x 16 ..W/22/37
275	M3 x 6
275	M3 x 10 ..W/22/37
278	M3 x 10
279	D3 x 12
281	D3 x 12
282	M3 x 6
283	M3 x 6
287	M3 x 10
296	D3 x 12
297	D3 x 12
298	M3 x 10
299	D3 x 12
300	M3 x 10
301	M3 x 10
302	D3 x 10
303	D3 x 10
304	M3 x 10
305	M3 x 10
310	D3 x 12
311	D3 x 10
312	D3 x 10
313	D3 x 10

Figure 1


To start service test program hold ▶| & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
Various other Tests

S refers to Service Mode.

V refers to Version.

yy refers to Software version number of µProcessor. (Counting up from 01 to 99)

TEST	*Activated with*	*ACTION*
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	▶| ■ to Exit	Key numbers according table 3 are shown on the display. (see Chapter 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
TEMPERATURE TEST	AUX ■ to Exit	Temperature in ^{o}C of the mains transformer as monitored by the NTC resistor is displayed.
VOLUME TEST	Volume Knob	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DPL TEST (only possible in Service Play mode)	DPL	The set enters into Pro-logic install mode. The noise-source switches between Left, Center, Right and Rear speakers. Pro-logic settings cannot be install in this test.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

FRONT BOARD - VARIATIONS TABLE

Front Boards application

A50350	FW754P/37
A50320	FW755P/30/37
A50460	FW765P/21/21M/33
A50410	FW775P/30/37
A50420	FW775P/22
A50440	FW765P/22/34 , FW795W/22
A50990	FW795W/37

Variations table for Front Board

	A50350	A50320	A50460	A50410	A50420	A50440	A50990
22	x	x	-	-	-	-	-
1401	-	-	-	x	x	-	-
1403	x	x	x	-	-	x	x
1407	-	-	-	-	x	x	-
1458	-	x	x	x	x	x	x
1462,1463	-	-	-	-	x	x	-
1474	x	x	x	x	-	-	x
1476	-	-	x	x	x	x	x
2415	-	-	-	-	100pF	100pF	-
2420	-	-	-	-	47pF	47pF	-
2421,2422	-	-	-	-	47pF	47pF	-
2423	-	-	-	-	560pF	560pF	-
2424	-	-	-	-	2,2µF	2,2µF	-
2425	-	-	-	-	100nF	100nF	-
2438	-	-	-	-	560pF	560pF	-
3533	-	-	-	-	1k	1k	-
3534	-	-	-	-	220k	220k	-
3535	-	-	-	-	2k2	2k2	-
3536	10k	10k	10k	10k	-	-	10k
3537,3538	-	-	-	-	10k	10k	-
3539	10k	10k	10k	10k	-	-	10k
3544	-	220R	220R	220R	220R	220R	220R
3561,3562	-	-	-	1R	1R	-	-
3597	10k	10k	10k	4k7	4k7	10k	10k
3603	6k8	6k8	-	-	-	-	-
3604	8k2	8k2	-	-	-	-	-
4421	x	x	-	-	-	-	-
4610	-	-	-	-	x	x	x
4611	-	x	-	x	x	-	x
4612	-	-	x	x	x	x	x
4613	-	x	-	x	x	-	x
4614	x	x	-	-	-	-	x
4615	-	-	x	x	x	x	x
5415	-	-	-	-	x	x	-
5417	-	-	-	-	x	x	-
6003	x	x	-	x	x	-	-
6007	x	-	-	-	-	-	-
6010	-	-	x	-	-	-	-
6012	-	-	-	-	-	-	-
6031	-	x	x	x	x	x	x
6054	-	-	-	x	x	-	-
7405	-	-	-	-	x	x	-

x = Item in use.

FRONT BOARD - VARIATIONS TABLE

Front Boards application

A50350	FW754P/37
A50320	FW755P/30/37
A50460	FW765P/21/21M/33
A50410	FW775P/30/37
A50420	FW775P/22
A50440	FW765P/22/34 , FW795W/22
A50990	FW795W/37

Variations table for Front Board

	A50350	A50320	A50460	A50410	A50420	A50440	A50990
22	x	x	-	-	-	-	-
1401	-	-	-	x	x	-	-
1403	x	x	x	-	-	x	x
1407	-	-	-	-	x	x	-
1458	-	x	x	x	x	x	x
1462,1463	-	-	-	-	x	x	-
1474	x	x	x	x	-	-	x
1476	-	-	x	x	x	x	x
2415	-	-	-	-	100pF	100pF	-
2420	-	-	-	-	47pF	47pF	-
2421,2422	-	-	-	-	47pF	47pF	-
2423	-	-	-	-	560pF	560pF	-
2424	-	-	-	-	2,2µF	2,2µF	-
2425	-	-	-	-	100nF	100nF	-
2438	-	-	-	-	560pF	560pF	-
3533	-	-	-	-	1k	1k	-
3534	-	-	-	-	220k	220k	-
3535	-	-	-	-	2k2	2k2	-
3536	10k	10k	10k	10k	-	-	10k
3537,3538	-	-	-	-	10k	10k	-
3539	10k	10k	10k	10k	-	-	10k
3544	-	220R	220R	220R	220R	220R	220R
3561,3562	-	-	-	1R	1R	-	-
3597	10k	10k	10k	4k7	4k7	10k	10k
3603	6k8	6k8	-	-	-	-	-
3604	8k2	8k2	-	-	-	-	-
4421	x	x	-	-	-	-	-
4610	-	-	-	-	x	x	x
4611	-	x	-	x	x	-	x
4612	-	-	x	x	x	x	x
4613	-	x	-	x	x	-	x
4614	x	x	-	-	-	-	x
4615	-	-	x	x	x	x	x
5415	-	-	-	-	x	x	-
5417	-	-	-	-	x	x	-
6003	x	x	-	x	x	-	-
6007	x	-	-	-	-	-	-
6010	-	-	x	-	-	-	-
6012	-	-	-	-	-	-	-
6031	-	x	x	x	x	x	x
6054	-	-	-	x	x	-	-
7405	-	-	-	-	x	x	-

x = Item in use.

Front Boards application

A50480	FW520C/37 , FW510C/37
A50160	FW530C/37 , FW535C/30
A50150	FW530C/22/34 , FW535C/22/34 , FW538/22/34
A50140	FW530C/21/21M , FW535C/21/21M , FW575C/21/21M/33 , FW538/21
A50390	FW550C/22
A50520	FW560C/37
A50380	FW570C/21/21M/33
A50370	FW570C/22
A50360	FW570C/37
A50500	FW520C/21
A51010	FW72C/37

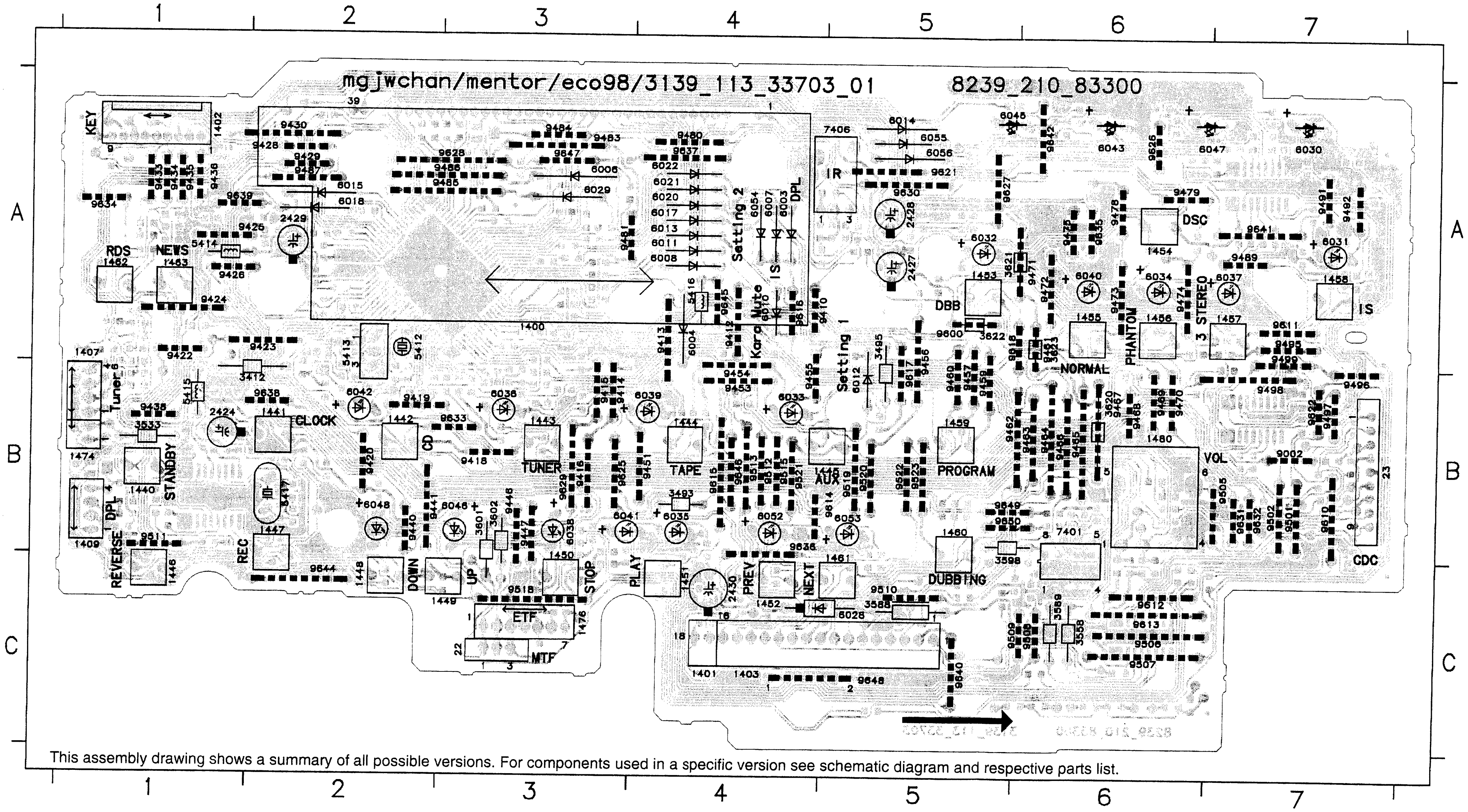
Variations table for Front Board

	A50480	A50160	A50150	A50140	A50390	A50520	A50380	A50370	A50360	A50500	A51010
22	x	-	-	-	-	x	-	-	-	x	-
1401	-	-	-	-	-	x	-	-	-	-	-
1403	x	x	x	x	x	-	x	x	x	x	x
1407	-	-	x	-	x	-	-	x	-	-	-
1458	-	x	x	x	x	-	x	x	x	-	-
1462,1463	-	-	x	-	x	-	-	x	-	-	-
1474	x	x	-	x	-	x	x	-	x	x	x
1476	-	x	x	x	x	-	x	x	x	-	x
2415	-	-	100pF	-	100pF	-	-	100pF	-	-	-
2420	-	-	47pF	-	47pF	-	-	47pF	-	-	-
2421,2422	-	-	47pF	-	47pF	-	-	47pF	-	-	-
2423	-	-	560pF	-	560pF	-	-	560pF	-	-	-
2424	-	-	2,2µF	-	2,2µF	-	-	2,2µF	-	-	-
2425	-	-	100nF	-	100nF	-	-	100nF	-	-	-
2438	-	-	560pF	-	560pF	-	-	560pF	-	-	-
3533	-	-	1k	-	1k	-	-	1k	-	-	-
3534	-	-	220k	-	220k	-	-	220k	-	-	-
3535	-	-	2k2	-	2k2	-	-	2k2	-	-	-
3536	10k	10k	-	10k	-	10k	10k	-	10k	10k	10k
3537,3538	-	-	10k	-	10k	-	-	10k	-	-	-
3539	10k	10k	-	10k	-	10k	10k	-	10k	10k	10k
3544	-	220R	220R	220R	220R	-	220R	220R	220R	-	-
3561,3562	-	-	-	-	1R	1R	-	1R	1R	-	-
3597	10k	10k	10k	10k	10k	4k7	10k	10k	10k	10k	10k
3603	6k8	-	-	-	-	6k8	-	-	-	6k8	-
3604	8k2	-	-	-	-	8k2	-	-	-	8k2	-
4421	x	-	-	-	-	x	-	-	-	x	-
4610	-	-	-	-	-	-	x	-	-	-	x
4611	x	-	x	-	-	x	-	x	-	-	-
4612	-	x	x	x	-	-	x	x	x	-	x
4613	x	-	-	-	x	-	x	-	x	-	-
4614	-	x	x	x	-	x	x	x	x	-	x
4615	-	-	-	-	x	x	x	-	x	-	-
5415	-	-	x	-	x	-	-	x	-	-	-
5417	-	-	x	-	x	-	-	x	-	-	-
6003	-	-	-	-	-	-	-	-	-	-	-
6007	x	-	-	-	-	x	-	-	-	-	x
6010	-	-	-	x	-	-	x	-	-	x	-
6012	-	-	-	-	x	-	-	-	-	-	-
6031	-	x	x	x	x	-	x	x	x	-	-
6054	-	-	-	-	x	x	-	-	-	-	-
7405	-	-	x	-	x	-	-	x	-	-	-

x = Item in use.

FRONT BOARD - COMPONENT LAYOUT

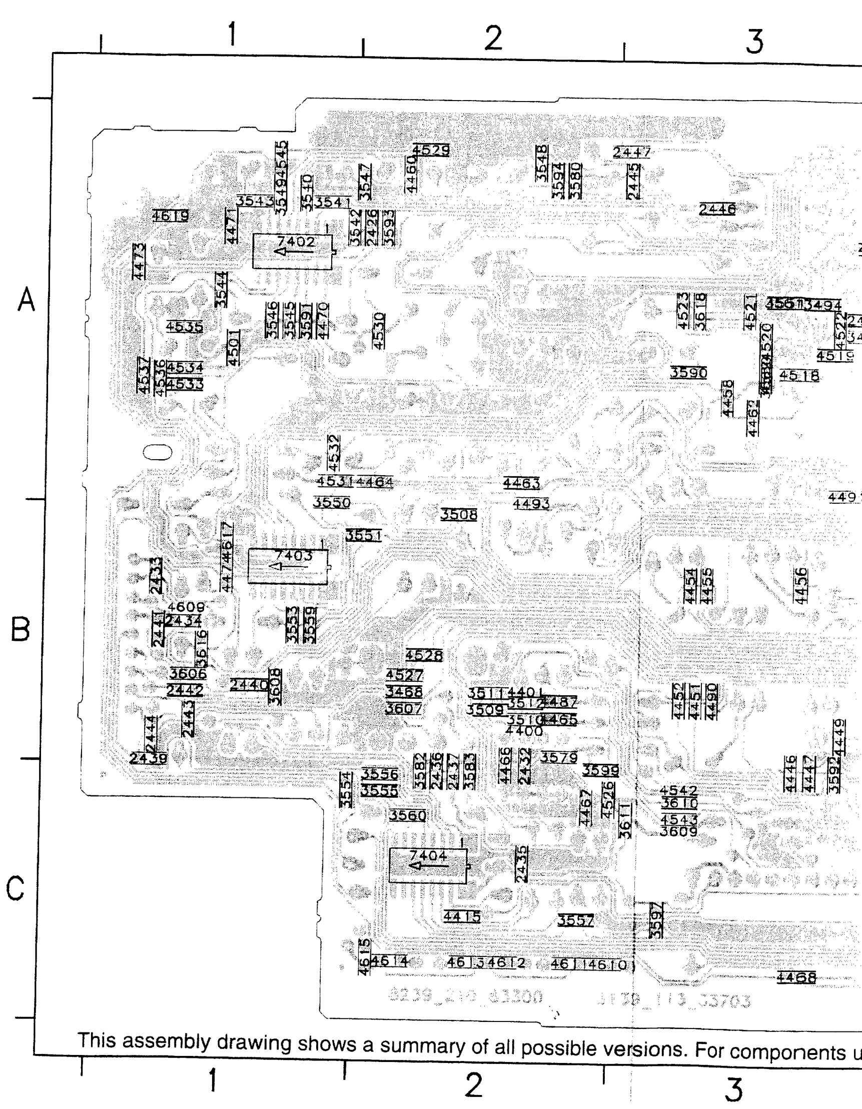
22	C3
23	B7
1400	A3
1401	C4
1402	A1
1403	C4
1407	A1
1409	B1
1440	B1
1441	B2
1442	B2
1443	B3
1444	B4
1445	B5
1446	C1
1447	B2
1448	C2
1449	C3
1450	B3
1451	C4
1452	C4
1453	A5
1454	A6
1455	A6
1456	A6
1457	A7
1458	A7
1459	B5
1460	B5
1461	B5
1462	A1
1463	A1
1474	B1
1476	C3
1480	B6
2424	B1
2427	A5
2428	A5
2429	A2
2430	C4
3412	B2
3493	B4
3495	A5
3533	B1
3558	C6
3588	C5
3589	C6
3598	B5
3601	B3
3602	B3
3620	B6
3621	A5
3622	A5
3623	A6
5412	A2
5413	A2
5414	A1
5415	B1
5416	A4
5417	B2
6003	A4
6004	A4
6006	A3
6007	A4
6008	A4
6010	A4
6011	A4
6012	B5
6013	A4
6014	A5
6015	A2
6017	A4
6018	A2
6020	A4
6021	A4
6022	A4
6028	C5
6029	A3
6030	A7
6031	A7
6032	A5
6033	B4
6034	A6
6035	B4
6036	B3
6037	A7
6038	B3
6039	B4
6040	A6
6041	B3
6042	B2
6043	A6
6045	A5
6046	B3
6047	A6
6048	B2
6052	B4
6053	B5
6054	A4
6055	A5
6056	A5
7401	B6
7406	A5
9002	B7
9410	A4
9412	A4
9413	A4
9414	B3
9415	B3
9416	B3
9418	B3
9419	B2
9420	B2
9422	A1
9423	A2
9424	A1
9425	A1
9426	A1
9428	A2
9429	A2
9430	A2
9433	A1
9434	A1
9435	A1
9436	A1
9438	B1
9440	B2
9441	B2
9446	B3
9447	B3
9451	B4
9453	B4
9454	B4
9455	B4
9456	A5
9457	B5
9459	B5
9460	B5
9461	A6
9462	B5
9463	B6
9464	B6
9465	B6
9466	B6
9467	B6
9468	B6
9469	B6
9470	B6
9471	A6
9472	A6
9473	A6
9474	A6
9475	A6
9478	A6
9479	A6
9480	A4
9481	A3
9483	A3
9484	A3
9485	A3
9486	A3
9487	A2
9489	A7
9491	A7
9492	A7
9495	A7
9496	B7
9497	B7
9498	B7
9499	A7
9501	B7
9502	B7
9505	B7
9506	C6
9507	C6
9508	C6
9509	C5
9510	C5
9511	B1
9512	B4
9513	B4
9515	B4
9518	C3
9519	B5
9520	B5
9521	B4
9522	B5
9523	B5
9600	A5
9610	B7
9611	A7
9612	C6
9613	C6
9614	B5
9615	B4
9616	A4
9617	B5
9618	A5
9621	A5
9622	B7
9625	B3
9626	A6
9627	A5
9628	A3
9629	B3
9630	A5
9631	B7
9632	B7
9633	B3
9634	A1
9635	A6
9636	B4
9637	A4
9638	B2
9639	A1
9640	C5
9641	A7
9642	A6
9644	C2
9645	A4
9646	B4
9647	A3
9648	C5
9649	B5
9650	B5



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

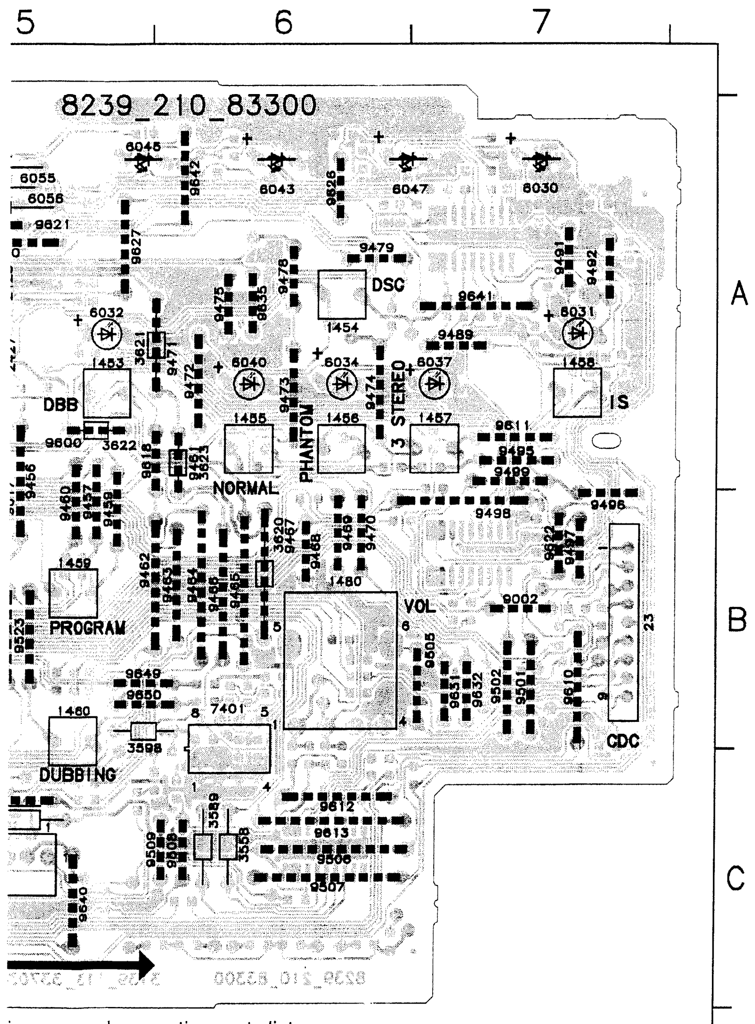
FRONT BOARD - CHIP LAYOUT

2400	B6
2401	B6
2402	B6
2403	B6
2404	A6
2405	A5
2407	B6
2408	A4
2409	A3
2410	B6
2411	B7
2412	B7
2415	B7
2416	B7
2417	B7
2418	B7
2419	A7
2420	B7
2421	B6
2422	B6
2423	B7
2425	B7
2426	A2
2431	A5
2432	B2
2433	B1
2434	B1
2435	C2
2436	C2
2437	C2
2438	B7
2439	B1
2440	B1
2441	B1
2442	B1
2443	B1
2444	B1
2445	A3
2446	A3
2447	A3
3400	B5
3401	B5
3402	B5
3403	B4
3404	B5
3405	B5
3406	B6
3407	B6
3408	B6
3409	B5
3410	B6
3411	A6
3413	A6
3417	A6
3418	A6
3419	A6
3420	A6
3421	A6
3422	A6
3432	A6
3433	A6
3435	A6
3436	A6
3437	A6
3438	A6
3439	A5
3440	A5
3441	A5
3442	A5
3443	A5
3444	A5
3445	A5
3446	A5
3447	A5
3448	A5
3449	A5
3450	A5
3451	A5
3452	A5
3453	A5
3454	A5
3455	A5
3456	A5
3457	A5
3458	A5
3459	A5
3460	A5
3461	A5
3463	A5
3464	A5
3466	A5
3467	A5
3468	B2
3470	A5
3474	A6
3475	B5
3478	B6
3479	A4
3490	A3
3491	A3
3492	A7
3494	A3
3496	A4
3497	A4
3498	A4
3499	A4
3505	A7
3506	A7
3507	A7
3508	B2
3509	B2
3510	B2
3511	B2
3512	B2
3521	B7
3522	B7
3525	B7
3526	A7
3527	A7
3528	A7
3529	B7
3530	B7
3531	A7
3532	A7
3534	B6
3535	B6
3536	B7
3537	B7
3538	B7
3539	B6
3540	A1
3541	A1
3542	A1
3543	A1
3544	A1
3545	A1



This assembly drawing shows a summary of all possible versions. For components u

9467	B6	9481	A3	9498	B7	9513	B4	9613	C6	9629	B3	9641	A7
9468	B6	9483	A3	9499	A7	9515	B4	9614	B5	9630	A5	9642	A6
9469	B6	9484	A3	9501	B7	9518	C3	9615	B4	9631	B7	9644	C2
9470	B6	9485	A3	9502	B7	9519	B5	9616	A4	9632	B7	9645	A4
9471	A6	9486	A3	9505	B7	9520	B5	9617	B5	9633	B3	9646	B4
9472	A6	9487	A2	9506	C6	9521	B4	9618	A5	9634	A1	9647	A3
9473	A6	9489	A7	9507	C6	9522	B5	9621	A5	9635	A6	9648	C5
9474	A6	9491	A7	9508	C6	9523	B5	9622	B7	9636	B4	9649	B5
9475	A6	9492	A7	9509	C5	9600	A5	9625	B3	9637	A4	9650	B5
9478	A6	9495	A7	9510	C5	9610	B7	9626	A6	9638	B2		
9479	A6	9496	B7	9511	B1	9611	A7	9627	A5	9639	A1		
9480	A4	9497	B7	9512	B4	9612	C6	9628	A3	9640	C5		

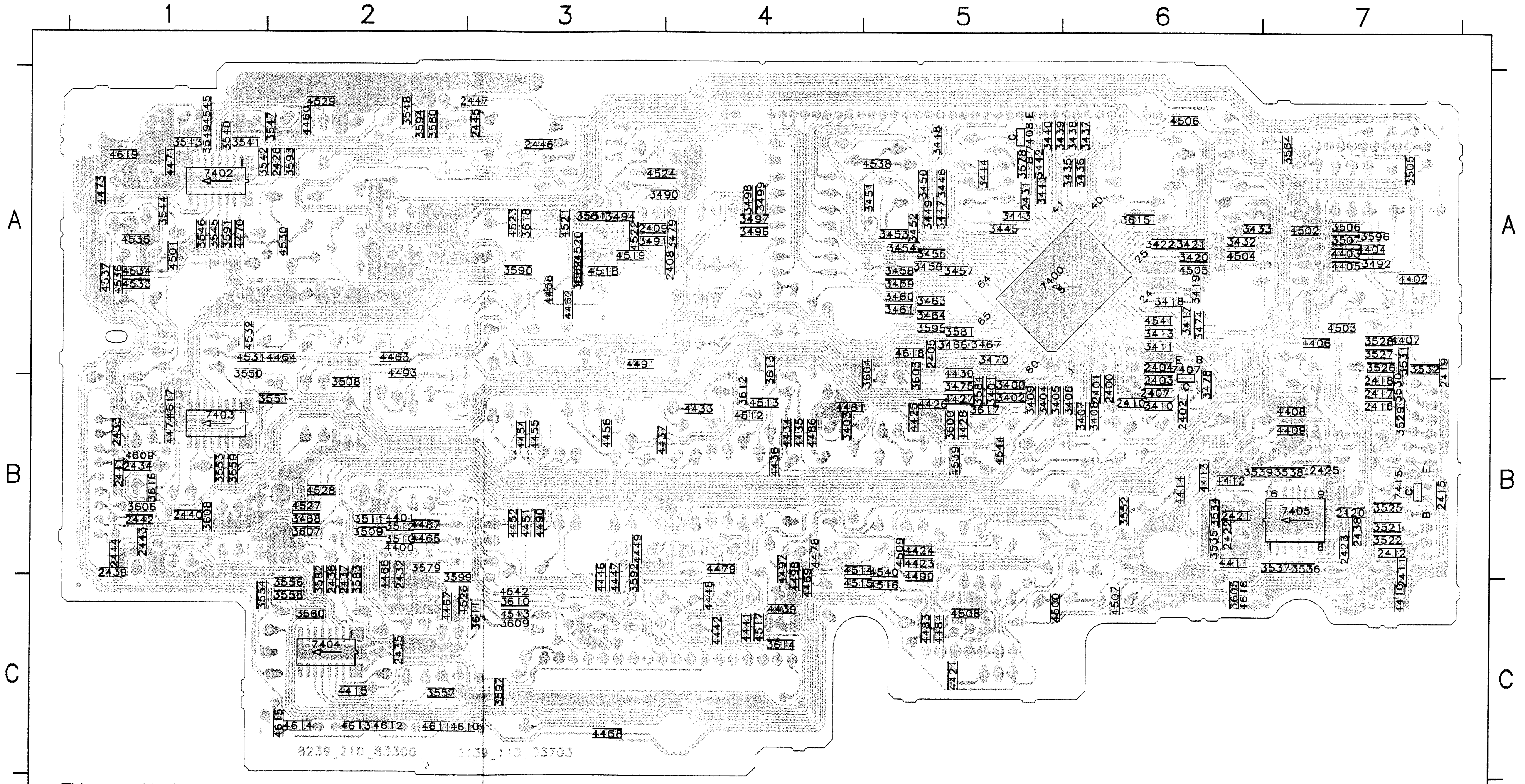


iagram and respective parts list.

FRONT BOARD - CHIP LAYOUT

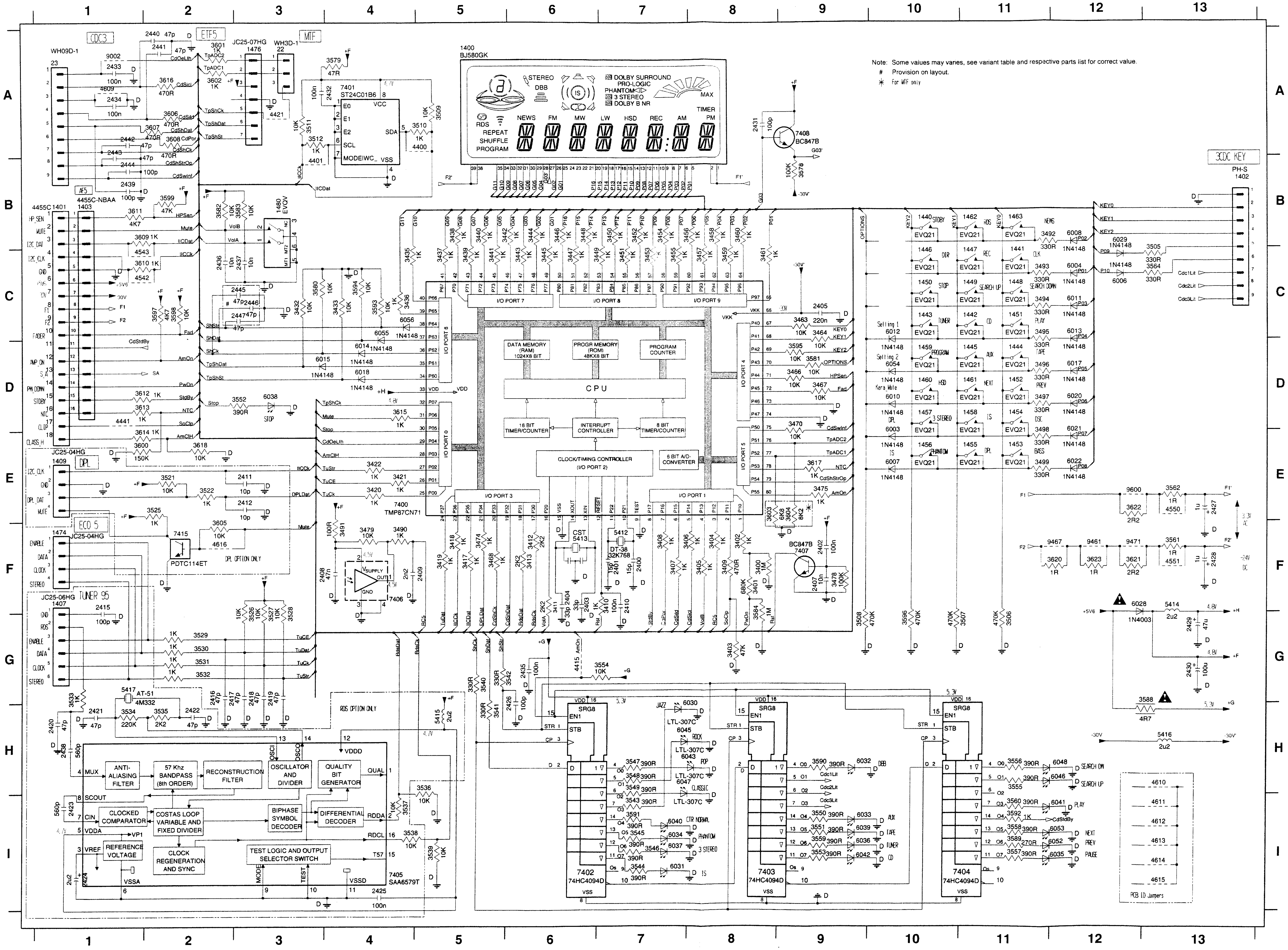
2400	B6	2420	B7	2442	B1	3411	A6	3442	A5	3459	A5	3496	A4	3528	A7	3546	A1	3578	A5
2401	B6	2421	B6	2443	B1	3413	A6	3443	A5	3460	A5	3497	A4	3529	B7	3547	A2	3579	B2
2402	B6	2422	B6	2444	B1	3417	A6	3444	A5	3461	A5	3498	A4	3530	B7	3548	A2	3580	A2
2403	B6	2423	B7	2445	A3	3418	A6	3445	A5	3463	A5	3499	A4	3531	A7	3549	A1	3581	A5
2404	A6	2425	B7	2446	A3	3419	A6	3446	A5	3464	A5	3505	A7	3532	A7	3550	A1	3582	C2
2405	A5	2426	A2	2447	A3	3420	A6	3447	A5	3466	A5	3506	A7	3534	B6	3551	B2	3583	C2
2407	B6	2431	A5	3400	B5	3421	A6	3448	A5	3467	A5	3507	A7	3535	B6	3552	B6	3584	B5
2408	A4	2432	B2	3401	B5	3422	A6	3449	A5	3468	B2	3508	B2	3536	B7	3553	B1	3590	A3
2409	A3	2433	B1	3402	B5	3432	A6	3450	A5	3470	A5	3509	B2	3537	B7	3554	C1	3591	A1
2410	B6	2434	B1	3403	B4	3433	A6	3451	A5	3474	A6	3510	B2	3538	B7	3555	C2	3592	C3
2411	B7	2435	C2	3404	B5	3435	A6	3452	A5	3475	B5	3511	B2	3539	B6	3556	C2	3593	A2
2412	B7	2436	C2	3405	B5	3436	A6	3453	A5	3478	B6	3512	B2	3540	A1	3557	C2	3594	A2
2415	B7	2437	C2	3406	B6	3437	A6	3454	A5	3479	A4	3521	B7	3541	A1	3559	B1	3595	A5
2416	B7	2438	B7	3407	B6	3438	A6	3455	A5	3490	A3	3522	B7	3542	A1	3560	C2	3596	A7
2417	B7	2439	B1	3408	B6	3439	A5	3456	A5	3491	A3	3525	B7	3543	A1	3561	A3	3597	C3
2418	B7	2440	B1	3409	B5	3440	A5	3457	A5	3492	A7	3526	A7	3544	A1	3562	A3	3599	C2
2419	A7	2441	B1	3410	B6	3441	A5	3458	A5	3494	A3	3527	A7	3545	A1	3564	A7	3600	B5

3603	A5	4401	B2	4424	B5	4449	B3	4471	A1	4501	A1	4520	A3	4538	A5	4616	C6
3604	A5	4402	A7	4425	B5	4451	B3	4473	A1	4502	A7	4521	A3	4539	B5	4617	B1
3605	C6	4403	A7	4426	B5	4452	B3	4474	B1	4503	A7	4522	A3	4540	B5	4618	A5
3606	B1	4404	A7	4427	B5	4454	B3	4478	B4	4504	A6	4523	A3	4541	A6	4619	A1
3607	B2	4405	A7	4428	B5	4455	B3	4479	B4	4505	A6	4524	A3	4542	C3	7400	A5
3608	B1	4406	A7	4430	A5	4456	B3	4481	B4	4506	A6	4526	C2	4543	C3	7402	A1
3609	C3	4407	A7	4433	B4	4458	A3	4483	C5	4507	C6	4527	B2	4544	B5	7403	B1
3610	C3	4408	B7	4434	B4	4460	A2	4484	C5	4508	C5	4528	B2	4545	A1	7404	C2
3611	C3	4409	B7	4435	B4	4462	A3	4486	B4	4509	B5	4529	A2	4550	A3	7405	B7
3612	B4	4410	C7	4436	B4	4463	A2	4487	B2	4512	B4	4530	A2	4551	A3	7407	A6
3613	A4	4411	B6	4437	B3	4464	A2	4490	B3	4513	B4	4531	A1	4609	B1	7408	A5
3614	C4	4412	B6	4439	C4	4465	B2	4491	A3	4514	B4	4532	A1	4610	C3	7415	B7
3615	A6	4413	B6	4441	C4	4466	B2	4493	A2	4515	C4	4533	A1	4611	C2		
3616	B1	4414	B6	4442	C4	4467	C2	4497	B4	4516	C5	4534	A1	4612	C2		
3617	B5	4415	C2	4446	C3	4468	C3	4498	B4	4517	C4	4535	A1	4613	C2		
3618	A3	4421	C5	4447	C3	4469	C4	4499	B5	4518	A3	4536	A1	4614	C2		
4400	B2	4423	B5	4448	C4	4470	A1	4500	C5	4519	A3	4537	A1	4615	C2		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CIRCUIT DIAGRAM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11
12
13
A
B
C
D
E
F
G
H
I
CDC3
WH09D-1
ETF5
JC25-07HG
1476
WH3D-1
MTF
7401
ST24C01B6
1400
BJ580GK
STEREO
DBB
DOLBY SURROUND
PRO-LOGIC
PHANTOM
3 STEREO
DOLBY B NR
MAX
TIMER
RDS
NEWS
FM
MW
LW
HSD
REC
AM
PM
REPEAT
SHUFFLE
PROGRAM
7408
BC847B
3CDC KEY
PH-S
1402
4455C 1401
4455C-NBAA 1403
#5
JC25-04HG
1409
DPL
ECO 5
1474
JC25-04HG
7415
PDTC114ET
DPL OPTION ONLY
JC25-06HG
1407
TUNER 95
1480
EVQV
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
7400
TMP87CN71
7406
7407
BC847B
CST
5413
DT-38
32K768
5412
EVQ21
STOP
STBY
DIR
REC
CLK
NEWS
SEARCH UP
SEARCH DOWN
PLAY
TUNER
CD
AUX
TAPE
PROGRAM
PREV
NEXT
DSC
3 STEREO
IS
DPL
PHANTOM
BASS
Setting 1
Setting 2
Kara. Mute
OPTIONS
KEY0
KEY1
KEY2
5417
AT-51
4M332
RDS OPTION ONLY
MUX
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
SCOUT
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
7405
SAA6579T
SRG8
EN1
STB
7402
74HC4094D
7403
74HC4094D
7404
74HC4094D
JAZZ
ROCK
POP
CLASSIC
CTR NORMAL
PHANTOM
3 STEREO
LTL-307C
DBB
SEARCH DN
SEARCH UP
PLAY
NEXT
PREV
PAUSE
6028
1N4003
5414
2u2
3588
4R7
5416
2u2
9600
3562
4550
9467
9461
9471
3561
4551
4610
4611
4612
4613
4614
4615
PCB ID Jumpers

Note: Some values may vanes, see variant table and respective parts list for correct value.
Provision on layout.
✱ For MTF only

22	A3
23	A1
1400	A5
1401	B1
1402	B13
1403	B1
1407	F1
1409	E1
1440	B10
1441	C11
1442	C11
1443	C10
1444	D11
1445	D11
1446	C10
1447	C11
1448	C11
1449	C11
1450	C10
1451	C11
1452	D11
1453	E11
1454	D11
1455	E11
1456	E10
1457	D10
1458	D11
1459	D10
1460	D10
1461	D11
1462	B11
1463	B11
1474	F1
1476	A3
1480	B3
2400	F7
2401	F7
2402	F9
2403	F6
2404	F6
2405	C9
2407	F9
2408	F3
2409	F5
2410	F7
2411	E3
2412	E3
2415	F1
2416	G2
2417	G2
2418	G3
2419	G3
2420	H1
2421	H1
2422	H2
2423	I1
2424	I1
2425	I4
2426	H6
2427	E13
2428	F13
2429	G13
2430	G13
2431	A8
2432	A4
2433	A1
2434	A1
2435	G6
2436	C2
2437	C3
2438	H1
2439	B1
2440	A2
2441	A2
2442	A1
2443	A1
2444	B1
2445	C3
2446	C3
2447	C3
3400	F8
3401	F8
3402	F8
3403	G8
3404	F8
3405	F8
3406	F7
3407	F7
3408	F7
3409	F8
3410	F7
3411	F6
3412	F6
3413	F6
3417	F5
3418	F5
3419	F5
3420	E4
3421	E4
3422	E4
3432	C3
3433	C4
3435	C4
3436	C4
3437	C5
3438	B5
3439	C5
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3441	C5
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3443	C6
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3445	C6
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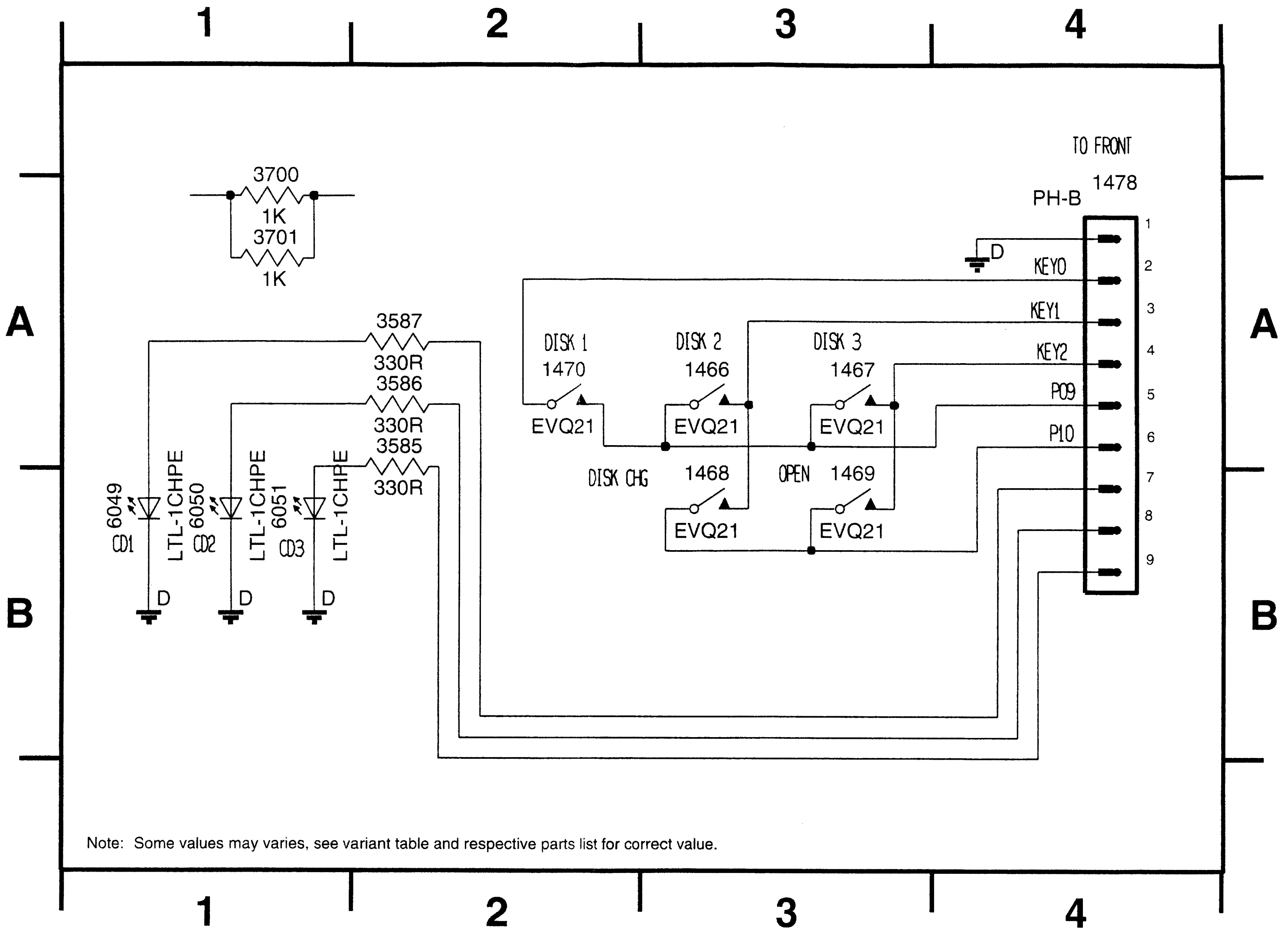
3449	C6
3450	B7
3451	C7
3452	B7
3453	C7
3454	B7
3455	C7
3456	B7
3457	C8
3458	B8
3459	C8
3460	B8
3461	C8
3463	C9
3464	C9
3466	D9
3467	D9
3468	F5
3470	D9
3474	F5
3475	E9
3478	F9
3479	F4
3490	F4
3491	F4
3492	B11
3493	C11
3494	C11
3495	C11
3496	D11
3497	D11
3498	E11
3499	E11
3505	C13
3506	G11
3507	G11
3508	G9
3509	A5
3510	A5
3511	A3
3512	A3
3521	E2
3522	E2
3525	E2
3526	G3
3527	G3
3528	G3
3529	G2
3530	G2
3531	G2
3532	G2
3533	G1
3534	H1
3535	H2
3536	H5
3537	I4
3538	I4
3539	I5
3540	G5
3541	H5
3542	G5
3543	I7
3544	I7
3545	I7
3546	I7
3547	H7
3548	H7
3549	H7
3550	I9
3551	I9
3552	D3
3553	I9
3554	G7
3555	H11
3556	H11
3557	I11
3558	I11
3559	I9
3560	I11
3561	F13
3562	E13
3564	C13
3578	B9
3579	A4
3580	C3
3581	D9
3582	B2
3583	B3
3584	G8
3588	G13
3589	I11
3590	H9
3591	I7
3592	I11
3593	C4
3594	C4
3595	D9
3596	G10
3597	C2
3598	C2
3599	B2
3600	E1
3601	A2
3602	A2
3603	E8
3604	E9
3605	F2
3606	A2
3607	A2
3608	A2
3609	B1
3610	C1
3611	B1
3612	D1
3613	D1
3614	E1
3615	D4
3616	A2
3617	E9
3618	E2
3620	F12
3621	F12
3622	E12
3623	F12
4400	A5
4401	B3
4415	G6
4421	A3
4441	D1
4542	C1
4543	C1
4550	E13
4551	F13
4609	A1
4610	H13
4611	I13
4612	I13
4613	I13
4614	I13
4615	I13
4616	F2
5412	F7
5413	F6
5414	F13
5415	H5
5416	H13
5417	G1
6003	E10
6004	C12
6006	C12
6007	E10
6008	B12
6010	D10
6011	C12
6012	C10
6013	C12
6014	D4
6015	D3
6017	D12
6018	D4
6020	D12
6021	E12
6022	E12
6028	F12
6029	B12
6030	G8
6031	I7
6032	H9
6033	I9
6034	I7
6035	I12
6036	I9
6037	I7
6038	D3
6039	I9
6040	I7
6041	I12
6042	I9
6043	H8
6045	H7
6046	H12
6047	H7
6048	H12
6052	I12
6053	I12
6054	D10
6055	C4
6056	C4
7400	E4
7401	A4
7402	I6
7403	I8
7404	I11
7405	I4
7406	F4
7407	F9
7408	A9
7415	F2
9002	A1
9461	F12
9467	F12
9471	F12
9600	E12

KEY-CDC PART

KEY-CDC BOARD - CIRCUIT DIAGRAM

1466 A3	1468 B3	1470 A2	3585 A2	3587 A2	3701 A1	6050 B1
1467 A3	1469 B3	1478 A4	3586 A2	3700 A1	6049 B1	6051 B1


1
2
3
4
A
B
3700
1K
3701
1K
3587
330R
3586
330R
3585
330R
6049
CD1
LTL-1CHPE
6050
CD2
LTL-1CHPE
6051
CD3
LTL-1CHPE
D
DISK 1
1470
EVQ21
DISK 2
1466
EVQ21
DISK 3
1467
EVQ21
DISK CHG
1468
EVQ21
OPEN
1469
EVQ21
TO FRONT
1478
PH-B
D
KEY0
KEY1
KEY2
P09
P10
1
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3
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5
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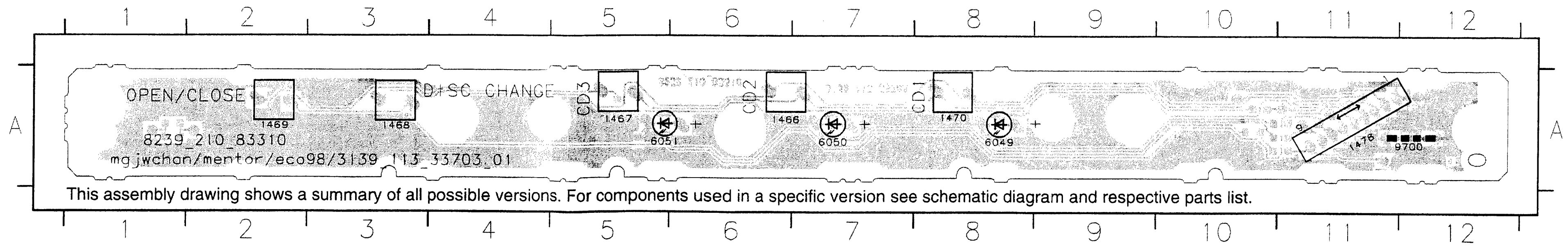
9

Note: Some values may varies, see variant table and respective parts list for correct value.

KEY-CDC BOARD - COMPONENT VIEW

1466 A6	1467 A5	1468 A3	1469 A2	1470 A8	1478 A11	6049 A8	6050 A7	6051 A5	9700 A12


1
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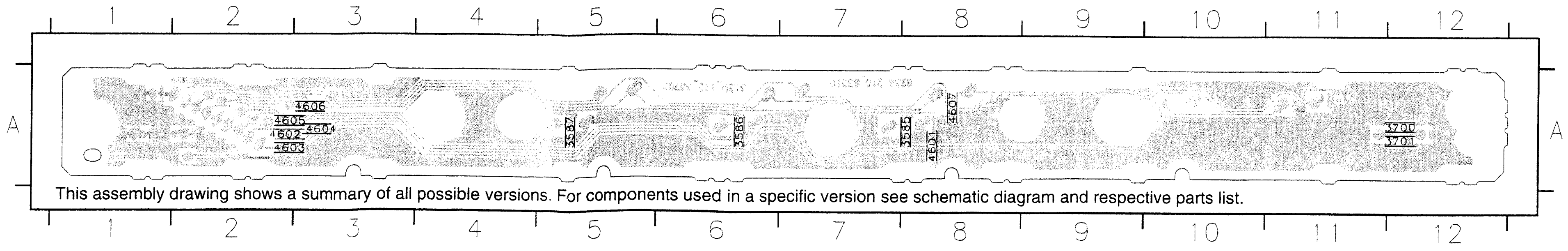
3
4
5
6
7
8
9
10
11
12
A
OPEN/CLOSE
DISC CHANGE
8239 210 83310
mgjwchan/mentor/eco98/3139 113 33703_01
CD3
CD2
CD1
1469
1468
1467
1466
1470
6051
6050
6049
1478
9700

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC BOARD - COPPER SIDE VIEW

3585 A8	3586 A6	3587 A5	3700 A12	3701 A12	4601 A8	4602 A2	4603 A2	4604 A3	4605 A2	4606 A3	4607 A8


1
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8
9
10
11
12
A
4606
4605
4602
4604
4603
3587
3586
3585
4601
4607
3700
3701

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF5 BOARD - VARIATIONS TABLE

AF5 Boards application

A50170	FW570C/21/21M/33
A51060	FW530C/21/21M , FW535C/21/21M , FW575C/21/21M/33 , FW538/21
A50180	FW550C/22 , FW570C/22/37
A51070	FW530C/22/34/37 , FW535C/22/30/34 , FW538/22/34
A50330	FW755P/30/37
A50340	FW754P/37
A50400	FW775P/22/30/37
A50430	FW765P/22/34 , FW795W/22/37
A50450	FW765P/21/21M/33
A50470	FW520C/37
A50510	FW560C/37
A50490	FW510C/37
A51000	FW520C/21
A51020	FW72C/37

Variations table for AF5 Board

	A50170	A50180	A50330	A50340	A50400	A50430	A50450
DM30	x	x	x	x	-	x	x
DM31	-	-	-	-	x	-	-
DM54,1517	-	-	x	x	x	x	x
DM56	x	x	-	-	x	x	x
DM59	-	-	x	x	-	-	-
DM61,1577	x	-	-	-	-	-	x
1506	x	x	x	x	-	x	x
1507	-	-	-	-	-	-	-
1510	x	x	x	x	-	x	x
1513	-	-	-	-	x	-	-
1523	x	x	x	x	-	x	x
1525	-	-	-	-	x	-	-
1530,1531	-	-	-	-	x	-	-
1579	7P	7P	6P	6P	7P	7P	7P
2521,2522	4.7µF	4.7µF	0.47µF	0.47µF	4.7µF	4.7µF	4.7µF
2541,2542	0.22µF	0.22µF	0.22µF	0.22µF	47µF	0.22µF	0.22µF
2585	47µF	47µF	-	-	47µF	47µF	47µF
2586	-	-	-	-	100nF	-	-
2603	-	-	100pF	100pF	100pF	100pF	100pF
2643	-	-	1µF	1µF	1µF	1µF	1µF
2652,2653	22nF	22nF	22nF	22nF	-	22nF	22nF
3501,3502	100R	100R	100R	100R	10k	100R	100R
3519,3520	-	-	6k8	6k8	6k8	6k8	6k8
3521,3522	15k	-	-	-	-	-	15k
3523,3524	8k2	8k2	47k	47k	8k2	8k2	8k2
3525,3526	3k3	3k3	39k	39k	3k3	3k3	3k3
3529	-	-	5k6	5k6	5k6	5k6	5k6
3530	-	-	15k	15k	15k	15k	15k
3563,3564	150k	150k	100k	100k	100k	100k	100k
3577,3578	4k7	4k7	4k7	-	4k7	4k7	4k7
3589	5k6	5k6	-	-	5k6	5k6	5k6
3597,3598	-	-	27k	27k	27k	27k	27k
3605,3606	1k5	-	1k5	1k5	1k8	1k5	1k5
3645,3646	-	-	1k8	1k8	1k8	1k8	1k8
3647,3648	100R	100R	100R	4k7	100R	100R	100R
3661,3662	5k6	-	-	-	-	-	-
3674	8k2	8k2	15k	15k	15k	15k	15k
3675	2k2	3k3	6k8	4k7	8k2	3k3	2k2
4501,4502	-	x	-	-	-	-	-
4525,4580	x	-	-	-	-	-	x
4527	-	-	x	x	x	x	x
4572	x	-	x	x	x	x	x
4573	-	-	x	x	x	x	x
4600,4602	-	-	-	-	x	-	-
4611,4612	x	-	x	x	x	x	x
4623	-	-	x	x	x	x	x
6501	x	x	-	-	x	x	x
9507	x	x	x	-	-	x	x
9589	x	x	x	x	x	x	x
9623,9624	-	-	-	-	x	-	-

x = Item in use.

Varia

DM3
DM3
DM5
DM5
DM5
DM6
1506
1507
1510
1513
1523
1525
1530
1579
2521
2541
2585
2586
2603
2643
2652
3501
3519
3521
3523
3525
3529
3530
3563
3577
3589
3597
3605
3645
3647
3661
3674
3675
4501
4525
4527
4572
4573
4600
4611
4623
6501
9507
9589
9623

x = Ite

Variations table for AF5 Board

	A50170	A50180	A50330	A50340	A50400	A50430	A50450
DM30	x	x	x	x	-	x	x
DM31	-	-	-	-	x	-	-
DM54,1517	-	-	x	x	x	x	x
DM56	x	x	-	-	x	x	x
DM59	-	-	x	x	-	-	-
DM61,1577	x	-	-	-	-	-	x
1506	x	x	x	x	-	x	x
1507	-	-	-	-	-	-	-
1510	x	x	x	x	-	x	x
1513	-	-	-	-	x	-	-
1523	x	x	x	x	-	x	x
1525	-	-	-	-	x	-	-
1530,1531	-	-	-	-	x	-	-
1579	7P	7P	6P	6P	7P	7P	7P
2521,2522	4.7µF	4.7µF	0.47µF	0.47µF	4.7µF	4.7µF	4.7µF
2541,2542	0.22µF	0.22µF	0.22µF	0.22µF	47µF	0.22µF	0.22µF
2585	47µF	47µF	-	-	47µF	47µF	47µF
2586	-	-	-	-	100nF	-	-
2603	-	-	100pF	100pF	100pF	100pF	100pF
2643	-	-	1µF	1µF	1µF	1µF	1µF
2652,2653	22nF	22nF	22nF	22nF	-	22nF	22nF
3501,3502	100R	100R	100R	100R	10k	100R	100R
3519,3520	-	-	6k8	6k8	6k8	6k8	6k8
3521,3522	15k	-	-	-	-	-	15k
3523,3524	8k2	8k2	47k	47k	8k2	8k2	8k2
3525,3526	3k3	3k3	39k	39k	3k3	3k3	3k3
3529	-	-	5k6	5k6	5k6	5k6	5k6
3530	-	-	15k	15k	15k	15k	15k
3563,3564	150k	150k	100k	100k	100k	100k	100k
3577,3578	4k7	4k7	4k7	-	4k7	4k7	4k7
3589	5k6	5k6	-	-	5k6	5k6	5k6
3597,3598	-	-	27k	27k	27k	27k	27k
3605,3606	1k5	-	1k5	1k5	1k8	1k5	1k5
3645,3646	-	-	1k8	1k8	1k8	1k8	1k8
3647,3648	100R	100R	100R	4k7	100R	100R	100R
3661,3662	5k6	-	-	-	-	-	-
3674	8k2	8k2	15k	15k	15k	15k	15k
3675	2k2	3k3	6k8	4k7	8k2	3k3	2k2
4501,4502	-	x	-	-	-	-	-
4525,4580	x	-	-	-	-	-	x
4527	-	-	x	x	x	x	x
4572	x	-	x	x	x	x	x
4573	-	-	x	x	x	x	x
4600,4602	-	-	-	-	x	-	-
4611,4612	x	-	x	x	x	x	x
4623	-	-	x	x	x	x	x
6501	x	x	-	-	x	x	x
9507	x	x	x	-	-	x	x
9589	x	x	x	x	x	x	x
9623,9624	-	-	-	-	x	-	-

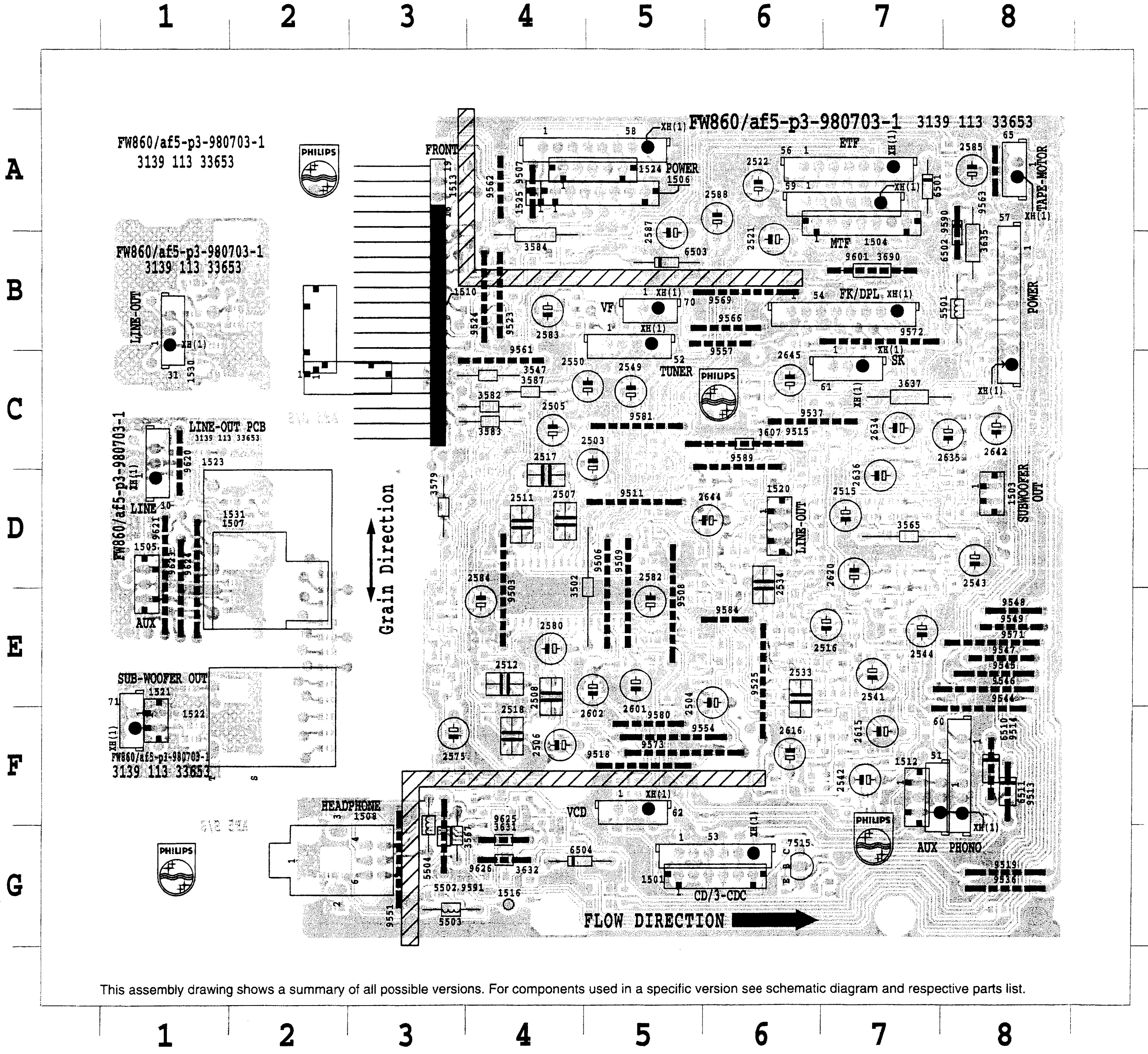
x = Item in use.

Variations table for AF5 Board

	A51060	A51070	A50470	A50510	A50490	A51000	A51020
DM30	x	x	-	-	-	-	-
DM31	-	-	-	x	-	-	-
DM54,1517	-	-	-	-	-	-	-
DM56	x	x	-	-	-	-	x
DM59	-	-	x	x	x	x	-
DM61,1577	x	-	-	-	-	x	-
1506	x	x	x	-	x	x	x
1507	-	-	x	-	x	x	x
1510	x	x	x	-	x	x	x
1513	-	-	-	x	-	-	-
1523	x	x	-	-	-	-	-
1525	-	-	-	x	-	-	-
1530,1531	-	-	-	x	-	-	-
1579	7P	7P	6P	6P	6P	6P	7P
2521,2522	4.7µF	4.7µF	0.47µF	0.47µF	0.47µF	0.47µF	4.7µF
2541,2542	1µF	1µF	0.22µF	0.22µF	0.22µF	1µF	0.22µF
2585	47µF	47µF	-	-	-	-	47µF
2586	-	-	100nF	100nF	100nF	100nF	100nF
2603	-	-	-	-	-	-	-
2643	-	-	-	-	-	-	-
2652,2653	22nF	22nF	-	-	-	-	-
3501,3502	100R	100R	100R	10k	100R	100R	100R
3519,3520	-	-	-	-	-	-	-
3521,3522	15k	-	-	-	-	15k	-
3523,3524	8k2	8k2	47k	47k	47k	47k	8k2
3525,3526	3k3	3k3	39k	39k	39k	39k	3k3
3529	-	-	-	-	-	-	-
3530	-	-	-	-	-	-	-
3563,3564	100k	100k	100k	100k	100k	100k	100k
3577,3578	4k7	4k7	-	-	-	4k7	-
3589	5k6	5k6	-	-	-	-	5k6
3597,3598	-	-	-	-	-	-	-
3605,3606	1k5	-	-	-	-	1k5	-
3645,3646	-	-	-	-	-	-	-
3647,3648	100R	100R	4k7	4k7	4k7	100R	4k7
3661,3662	5k6	-	-	-	-	5k6	-
3674	8k2	8k2	8k2	8k2	8k2	8k2	8k2
3675	2k2	3k3	6k8	8k2	4k7	10k	15k
4501,4502	-	x	x	x	x	-	x
4525,4580	x	-	-	-	-	x	-
4527	-	-	-	-	-	-	-
4572	x	-	-	-	-	x	-
4573	-	-	-	-	-	-	-
4600,4602	-	-	-	x	-	-	-
4611,4612	x	-	-	-	-	x	-
4623	-	-	-	-	-	-	-
6501	x	x	-	-	-	-	x
9507	x	x	x	-	-	x	x
9589	x	x	-	x	-	-	-
9623,9624	-	-	-	x	-	-	-

x = Item in use.

AF5 BOARD - COMPONENT LAYOUT

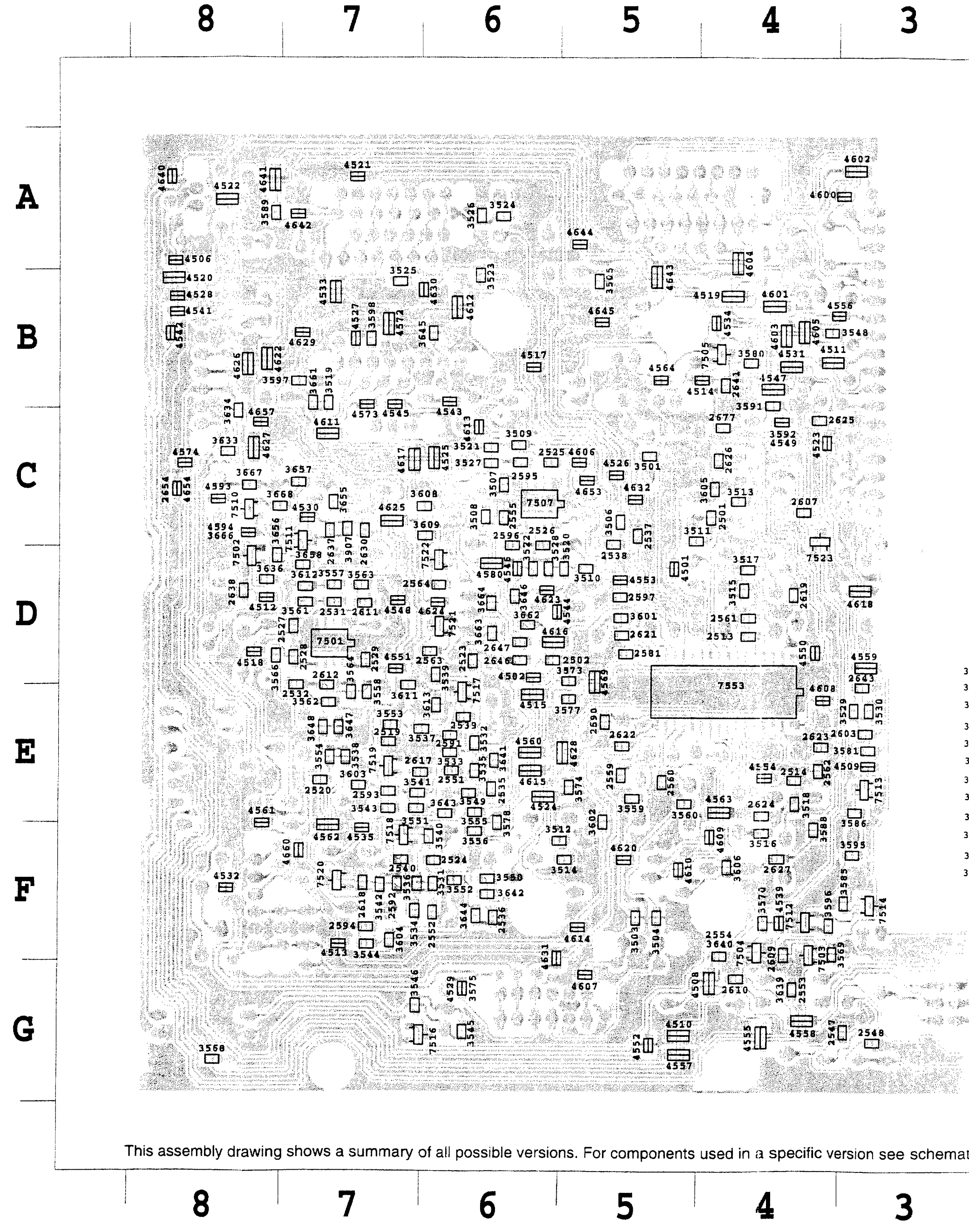


FW860/af5-p3-980703-1 3139 113 33653
FRONT
POWER
ETF
TAPE-MOTOR
MTF
FK/DPL
VF
TUNER
SK
LINE-OUT
LINE-OUT PCB
LINE
AUX
SUB-WOOFER OUT
SUBWOOFER OUT
HEADPHONE
VCD
CD/3-CDC
AUX PHONO
Grain Direction
FLOW DIRECTION
PHILIPS

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

30	C	1
31	B	1
51	F	7
52	B	5
53	G	6
54	B	7
56	A	7
57	B	8
58	A	5
59	A	7
60	F	8
61	C	7
62	F	5
65	A	8
70	B	5
71	F	1
1501	G	6
1503	D	8
1504	A	7
1505	D	1
1506	A	5
1507	E	2
1508	G	2
1510	B	3
1512	F	7
1513	B	3
1516	G	4
1520	D	6
1521	F	1
1522	F	2
1523	D	2
1524	A	5
1525	A	5
1530	B	2
1531	C	2
2503	C	5
2504	E	6
2505	C	4
2506	F	4
2507	D	4
2508	E	4
2511	D	4
2512	E	4
2515	D	7
2516	E	7
2517	D	4
2518	F	4
2521	B	6
2522	A	6
2533	E	6
2534	D	6
2541	E	7
2542	F	7
2543	D	8
2544	E	7
2549	C	5
2550	C	5
2575	F	3
2580	E	4
2582	E	5
2583	B	4
2584	E	4
2585	A	8
2587	B	5
2588	A	6
2601	E	5
2602	E	5
2615	F	7
2616	F	6
2620	D	7
2634	C	7
2635	C	8
2636	D	7
2642	C	8
2644	D	6
2645	C	6
3502	E	5
3547	C	4
3565	D	7
3567	G	3
3579	D	3
3582	C	4
3583	C	4
3584	B	4
3587	C	4
3607	C	6
3631	G	4
3632	G	4
3635	B	8
3637	C	7
3690	B	7
5501	B	8
5502	G	3
5503	G	3
5504	G	3
6501	A	7
6502	B	8
6503	B	5
6504	G	4
6510	F	8
6511	F	8
7515	G	6
9503	E	4
9506	E	5
9507	A	4
9508	E	5
9509	E	5
9511	D	5
9513	F	8
9514	F	8
9515	C	6
9518	F	5
9519	G	8
9523	B	4
9524	B	4
9525	E	6
9536	G	8
9537	C	6
9544	F	8
9545	E	8
9546	E	8
9547	E	8
9548	E	8
9549	E	8
9551	G	3
9554	F	5
9557	B	6
9561	C	4
9562	A	4
9563	A	8
9566	B	6
9569	B	6
9571	E	8
9572	B	7
9573	F	5
9580	F	5
9581	C	5
9584	E	6
9589	C	6
9590	B	8
9591	G	3
9601	B	7
9620	C	1
9621	D	1
9623	E	1
9624	D	1
9625	G	4
9626	G	4

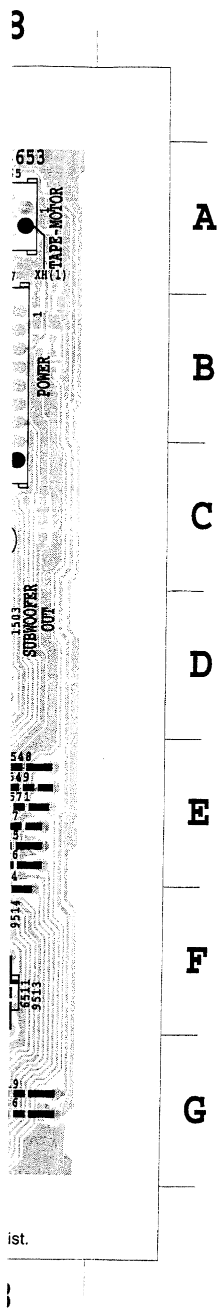
AF5 BOARD - CHIP LAYOUT



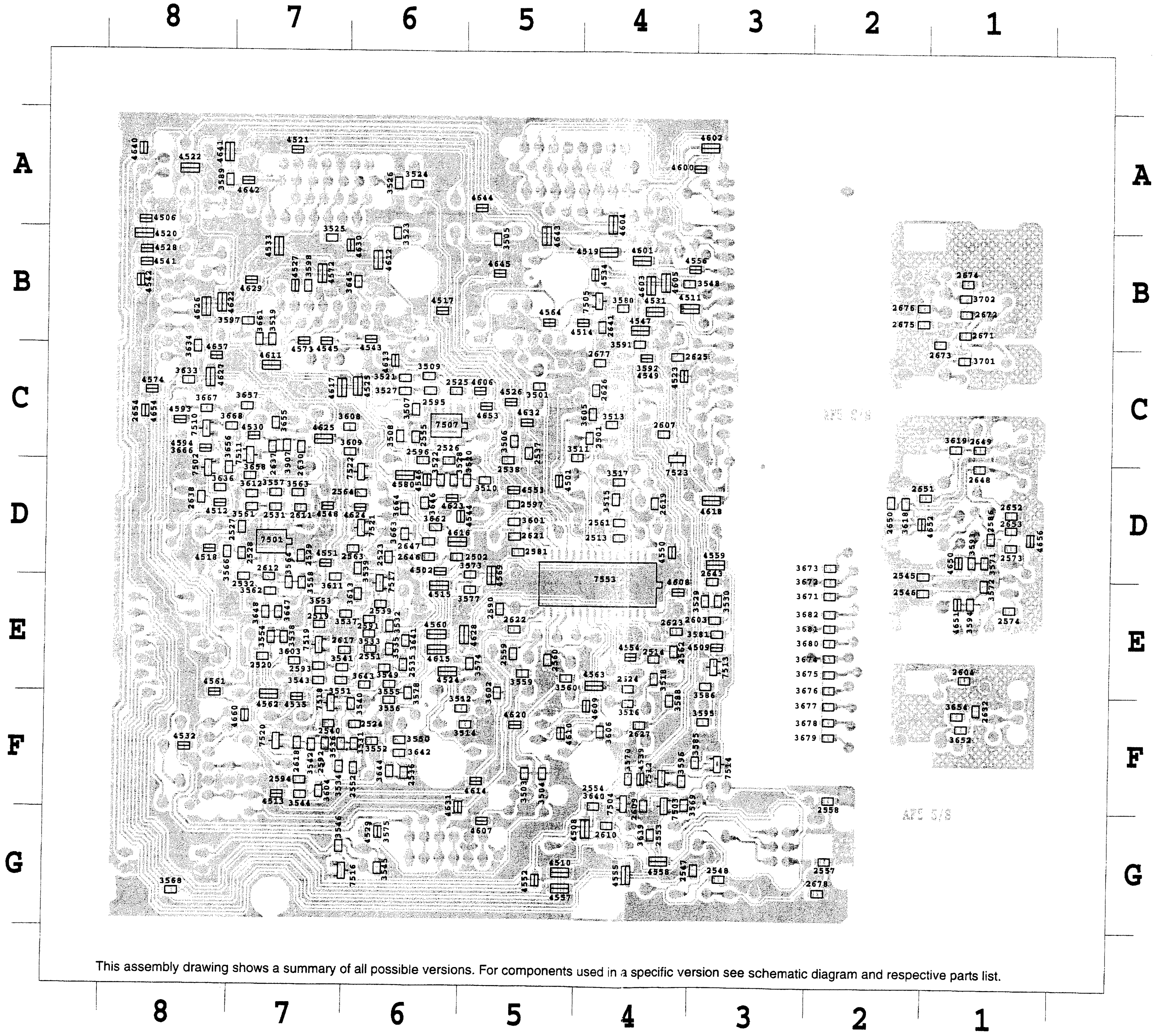
7501
7507
7553

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schemat

AF5 BOARD - CHIP LAYOUT



30	C	1	2580	E	4	9536	G	8
31	B	1	2582	E	5	9537	C	6
51	F	7	2583	B	4	9544	F	8
52	B	5	2584	E	4	9545	E	8
53	G	6	2585	A	8	9546	E	8
54	B	7	2587	B	5	9547	E	8
56	A	7	2588	A	6	9548	E	8
57	B	8	2601	E	5	9549	E	8
58	A	5	2602	E	5	9551	G	3
59	A	7	2615	F	7	9554	F	5
60	F	8	2616	F	6	9557	B	6
61	C	7	2620	D	7	9561	C	4
62	F	5	2634	C	7	9562	A	4
65	A	8	2635	C	8	9563	A	8
70	B	5	2636	D	7	9566	B	6
71	F	1	2642	C	8	9569	B	6
1501	G	6	2644	D	6	9571	E	8
1503	D	8	2645	C	6	9572	B	7
1504	A	7	3502	E	5	9573	F	5
1505	D	1	3547	C	4	9580	F	5
1506	A	5	3565	D	7	9581	C	5
1507	E	2	3567	G	3	9584	E	6
1508	G	2	3579	D	3	9589	C	6
1510	B	3	3582	C	4	9590	B	8
1512	F	7	3583	C	4	9591	G	3
1513	B	3	3584	B	4	9601	B	7
1516	G	4	3587	C	4	9620	C	1
1520	D	6	3607	C	6	9621	D	1
1521	F	1	3631	G	4	9623	E	1
1522	F	2	3632	G	4	9624	D	1
1523	D	2	3635	B	8	9625	G	4
1524	A	5	3637	C	7	9626	G	4
1525	A	5	3690	B	7			
1530	B	2	5501	B	8			
1531	C	2	5502	G	3			
2503	C	5	5503	G	3			
2504	E	6	5504	G	3			
2505	C	4	6501	A	7			
2506	F	4	6502	B	8			
2507	D	4	6503	B	5			
2508	E	4	6504	G	4			
2511	D	4	6510	F	8			
2512	E	4	6511	F	8			
2515	D	7	7515	G	6			
2516	E	7	9503	E	4			
2517	D	4	9506	E	5			
2518	F	4	9507	A	4			
2521	B	6	9508	E	5			
2522	A	6	9509	E	5			
2533	E	6	9511	D	5			
2534	D	6	9513	F	8			
2541	E	7	9514	F	8			
2542	F	7	9515	C	6			
2543	D	8	9518	F	5			
2544	E	7	9519	G	8			
2549	C	5	9523	B	4			
2550	C	5	9524	B	4			
2575	F	3	9525	E	6			



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2501	C	4	2618	F	7	3528	D	6	3596	F	4	4502	D	6	4580	D	6	7514	F	3
2502	D	6	2619	D	4	3529	E	3	3597	B	7	4506	A	8	4593	C	8	7516	G	7
2513	D	4	2621	D	5	3530	E	3	3598	B	7	4508	G	4	4594	C	8	7517	E	6
2514	E	4	2622	E	5	3531	F	6	3601	D	5	4509	E	3	4600	A	3	7518	F	7
2519	E	7	2623	E	4	3532	E	6	3602	E	5	4510	G	5	4601	B	4	7519	E	7
2520	E	7	2624	E	4	3533	E	6	3603	E	7	4511	B	4	4602	A	3	7520	F	7
2523	D	6	2625	C	4	3534	F	7	3604	F	7	4512	D	8	4603	B	4	7521	D	6
2524	F	6	2626	C	4	3535	E	6	3605	C	4	4513	F	7	4604	A	4	7522	D	6
2525	C	6	2627	F	4	3536	F	7	3606	F	4	4514	B	4	4605	B	4	7523	C	4
2526	C	6	2630	C	7	3537	E	6	3608	C	6	4515	E	6	4606	C	5	7553	E	4
2527	D	7	2632	F	1	3538	E	7	3609	C	6	4517	B	6	4607	G	5			
2528	D	7	2637	C	7	3539	D	6	3611	E	7	4518	D	8	4608	E	4			
2529	D	7	2638	D	8	3540	F	6	3612	D	7	4519	B	4	4609	F	4			
2531	D	7	2641	B	4	3541	E	7	3613	E	6	4520	B	8	4610	F	5			
2532	E	7	2643	E	3	3542	F	7	3618	D	2	4521	A	7	4611	C	7			
2535	E	6	2646	D	6	3543	E	7	3619	C	1	4522	A	8	4612	B	6			
2536	F	6	2647	D	6	3544	F	7	3633	C	8	4523	C	4	4613	C	6			
2537	C	5	2648	D	1	3545	G	6	3634	C	8	4524	E	6	4614	F	5			
2538	C	5	2649	C	1	3546	G	7	3636	D	8	4525	C	6	4615	E	6			
2539	E	6	2650	D	2	3548	B	4	3639	G	4	4526	C	5	4616	D	6			
2540	F	7	2651	D	2	3549	E	6	3640	F	4	4527	B	7	4617	C	7			
2545	D	2	2652	D	1	3550	F	6	3641	E	6	4528	B	8	4618	D	3			
2546	E	2	2653	D	1	3551	E	7	3642	F	6	4529	G	6	4620	F	5			
2547	G	3	2654	C	8	3552	F	6	3643	E	6	4530	C	7	4622	B	8			
2548	G	3	2671	B	1	3553	E	7	3644	F	6	4531	B	4	4623	D	6			
2551	E	6	2672	B	1	3554	E	7	3645	B	6	4532	F	8	4624	D	6			
2552	F	6	2673	B	1	3555	E	6	3646	D	6	4533	B	7	4625	C	7			
2553	G	4	2674	B	1	3556	F	6	3647	E	7	4534	B	4	4626	B	8			
2554	F	4	2675	B	2	3557	D	7	3648	E	7	4535	F	7	4627	C	8			
2555	C	6	2676	B	2	3558	E	7	3652	F	1	4539	F	4	4628	E	5			
2557	G	2	2677	C	4	3559	E	5	3654	F	1	4541	B	8	4629	B	7			
2558	F	2	2678	G	2	3560	E	5	3655	C	7	4542	B	8	4630	B	6			
2559	E	5	3501	C	5	3561	D	7	3656	D	8	4543	B	6	4631	F	6			
2560	E	5	3503	F	5	3562	E	7	3657	C	7	4544	D	6	4632	C	5			
2561	D	4	3504	F	5	3563	D	7	3658	D	7	4545	B	7	4640	A	8			
2562	E	4	3505	B	5	3564	E	7	3661	B	7	4546	D	6	4641	A	8			
2563	D	6	3506	C	5	3566	D	8	3662	D	6	4547	B	4	4642	A	7			
2564	D	6	3507	C	6	3568	G	8	3663	D	6	4548	D	7	4643	B	5			
2573	D	1	3508	C	6	3569	F	4	3664	D	6	4549	C	4	4644	A	5			
2574	E	1	3509	C	6	3570	F	4	3666	C	8	4550	D	4	4645	B	5			
2581	D	5	3510	D	5	3571	D	1	3667	C	8	4551	D	7	4650	D	1			
2586	D	1	3511	C	5	3572	E	1	3668	C	8	4552	G	5	4651	E	1			
2590	E	5	3512	F	5	3573	D	5	3671	E	2	4553	D	5	4652	D	2			
2591	E	6	3513	C	4	3574	E	5	3672	E	2	4554	E	4	4653	C	5			
2592	F	7	3514	F	5	3575	G	6	3673	D	2	4555	G	4	4654	C	8			
2593	E	7	3515	D	4	3577	E	5	3674	E	2	4556	B	4	4656	D	1			
2594	F	7	3516	F	4	3578	F	6	3675	E	2	4557	G	5	4657	C	8			
2595	C	6	3517	D	4	3580	B	4	3676	E	2	4558	G	4	4660	F	7			
2596	C	6	3518	E	4	3581	E	3	3677	F	2	4559	D	3	7501	D	7			
2597	D	5	3519	B	7	3585	F	3	3678	F	2	4560	E	6	7502	D	8			
2603	E	3	3520	D	5	3586	E	3	3679	F	2	4561	F	8	7503	F	4			
2604	E	1	3521	C	6	3588	F	4	3680	E	2	4562	F	7	7504	F	4			
2607	C	4	3522	D	6	3589	A	8	3681	E	2	4563	E	4	7505	B	4			
2609	F	4	3523	B	6	3591	B	4	3682	E	2	4564	B	5	7507	C	6			
2610	G	4	3524	A	6	3592	C	4	3701	C	1	4569	D	5	7510	C	8			
2611	D	7	3525	B	7	3593	D	1	3702	B	1	4572	B	7	7511	C	7			
2612	E	7	3526	A	6	3594	E	1	3907	C	7	4573	B	7	7512	F	4			
2617	E	7	3527	C	6	3595	F	3	4501	D	5	4574	C	8	7513	E	3			

AF5 BOARD - CIRCUIT DIAGRAM

1501	C 2
1503	J20
1504	H 1
1505	K11
1506	L22
1507	K 7
1508	E21
1510	J 1
1512	A 2
1513	J 1
1516	D22
1520	H 4
1521	J21
1522	I22
1523	K 8
1524	L22
1525	L22
1530	K11
1531	K 6
2501	B 8
2502	H 8
2503	C 8
2504	G 8
2505	C 8
2506	G 8
2507	C 9
2508	H 9
2511	C 9
2512	H 9
2513	C10
2514	G10
2515	K17
2516	J16
2517	C 9
2518	H 9
2519	E16
2520	H16
2521	D 4
2522	D 5
2523	F13
2524	F12
2525	A 7
2526	H 7
2527	C17
2528	D17
2529	D18
2531	B17
2532	E17
2533	E13
2534	H13
2535	E14
2536	H14
2537	C 4
2538	G 4
2539	C14
2540	G14
2541	C17
2542	E17
2543	C19
2544	E19
2545	L 9
2546	L 9
2547	D21
2548	D21
2549	B 2
2550	C 2
2551	D14
2552	G14
2553	F20
2554	F19
2555	I 6
2557	D20
2558	D20
2559	C 5
2560	G 6
2561	B10
2562	G10
2563	I 4
2564	I 5
2573	K10
2574	L10
2575	C20
2580	G 6
2581	C 7
2582	G 7
2583	I10
2584	I11
2585	H 3
2586	M 7
2587	B 4
2588	F 4
2590	G 7
2591	C15
2592	F15
2593	D15
2594	G15
2595	B 7
2596	I 7
2597	C 6
2601	C 4
2602	G 5
2603	F18
2604	K22
2607	L 4
2609	D20
2610	E20
2611	B18
2612	E18
2615	C16
2616	H16
2617	E15
2618	I15
2619	I11
2620	E18
2621	A 4
2622	A 3
2623	I10
2624	J13
2625	K 3
2626	M 5
2627	M 5
2630	K17
2632	J22
2634	I18
2635	H20
2636	J18
2637	J18
2638	J20
2641	I10
2642	I19
2643	F18
2644	H 8
2645	C 8
2646	B 6
2647	I 5
2648	M10
2649	M10
2650	M 9
2651	M 9
2652	M 8
2653	M 8
2654	J16
2671	L13
2672	L13
2673	L12
2674	L12
2675	M12
2676	M12
2677	J13
2678	D20
30	M10
31	K13
3501	B 3
3502	C 3
3503	B 4
3504	G 4
3505	B 4
3506	G 4
3507	C 7
3508	I 7
3509	B 7
3510	H 7
3511	C 8
3512	H 8
3513	C 9
3514	H 9
3515	B 9
3516	I 9
3517	B 9
3518	I 9
3519	B 6
3520	H 6
3521	B 8
3522	I 8
3523	E 4
3524	E 5
3525	E 4
3526	E 5
3527	B 8
3528	H 8
3529	F18
3530	F18
3531	F12
3532	F13
3533	C13
3534	G13
3535	D13
3536	G13
3537	C14
3538	F14
3539	D14
3540	G14
3541	C15
3542	G15
3543	D15
3544	G15
3545	L16
3546	M15
3547	M16
3548	M16
3549	E14
3550	I14
3551	E15
3552	I15
3553	C15
3554	F15
3555	C16
3556	I16
3557	B17
3558	E17
3559	C 4
3560	G 5
3561	C17
3562	D17
3563	B18
3564	F18
3565	C18
3566	E18
3567	C19
3568	E19
3569	D19
3570	D19
3571	L 9
3572	L 9
3573	B11
3574	G11
3575	L15
3577	C12
3578	G12
3579	C22
3580	H10
3581	C21
3582	H11
3583	H12
3584	B18
3585	C20
3586	C21
3587	M 4
3588	M 4
3589	G 2
3591	L 3
3592	M 4
3593	L 8
3594	L 8
3595	C21
3596	B20
3597	B 5
3598	H 5
3601	A 3
3602	A 3
3603	D16
3604	H16
3605	B 9
3606	J 9
3607	I 7
3608	J 5
3609	J 4
3611	K16
3612	K16
3613	I17
3618	M 8
3619	L 8
3631	F21
3632	F19
3633	G20
3634	G20
3635	D18
3636	J19
3637	H19
3639	F21
3640	F19
3641	E14
3642	H14
3643	E15
3644	H15
3645	A 8
3646	J 8
3647	C17
3648	E17
3652	J21
3654	K22
3655	J18
3656	J19
3657	J18
3658	K18
3661	A 8
3662	J 7
3663	G 4
3664	I 5
3666	I19
3667	I19
3668	J19
3671	J12
3672	J12
3673	J12
3674	J10
3675	J10
3676	J10
3677	J10
3678	K10
3679	K10
3680	J12
3681	K12
3682	K12
3690	J14
3701	L12
3702	L12
3907	J18
4501	B 8
4502	H 8
4506	J15
4527	J14
4529	L15
4543	C 6
4544	H 6
4545	A 7
4546	J 8
4549	M 4
4563	J12
4574	K13
4593	I19
4594	I19
4650	L 8
4651	L 8
4652	M 8
4654	J16
51	A 2
52	B 1
53	C 2
54	E 2
5501	D18
5502	D21
5503	E20
5504	E20
56	H 2
57	G22
58	L21
59	I 1
60	A 1
61	F 1
62	D 1
65	G 1
6501	H 2
6502	C18
6503	H10
6504	F19
6510	K14
6511	K15
70	G 1
71	J21
7501	B18
7501	E18
7502	J19
7503	D19
7504	E19
7505	H10
7507	B 6
7507	I 7
7510	J19
7511	K18
7512	B20
7513	C21
7514	B20
7515	L15
7516	M15
7517	D15
7518	G15
7519	D15
7520	H15
7521	I 4
7522	I 5
7523	M 3
7553	C12
9513	K14
9514	K14
9515	I 7
9590	C18
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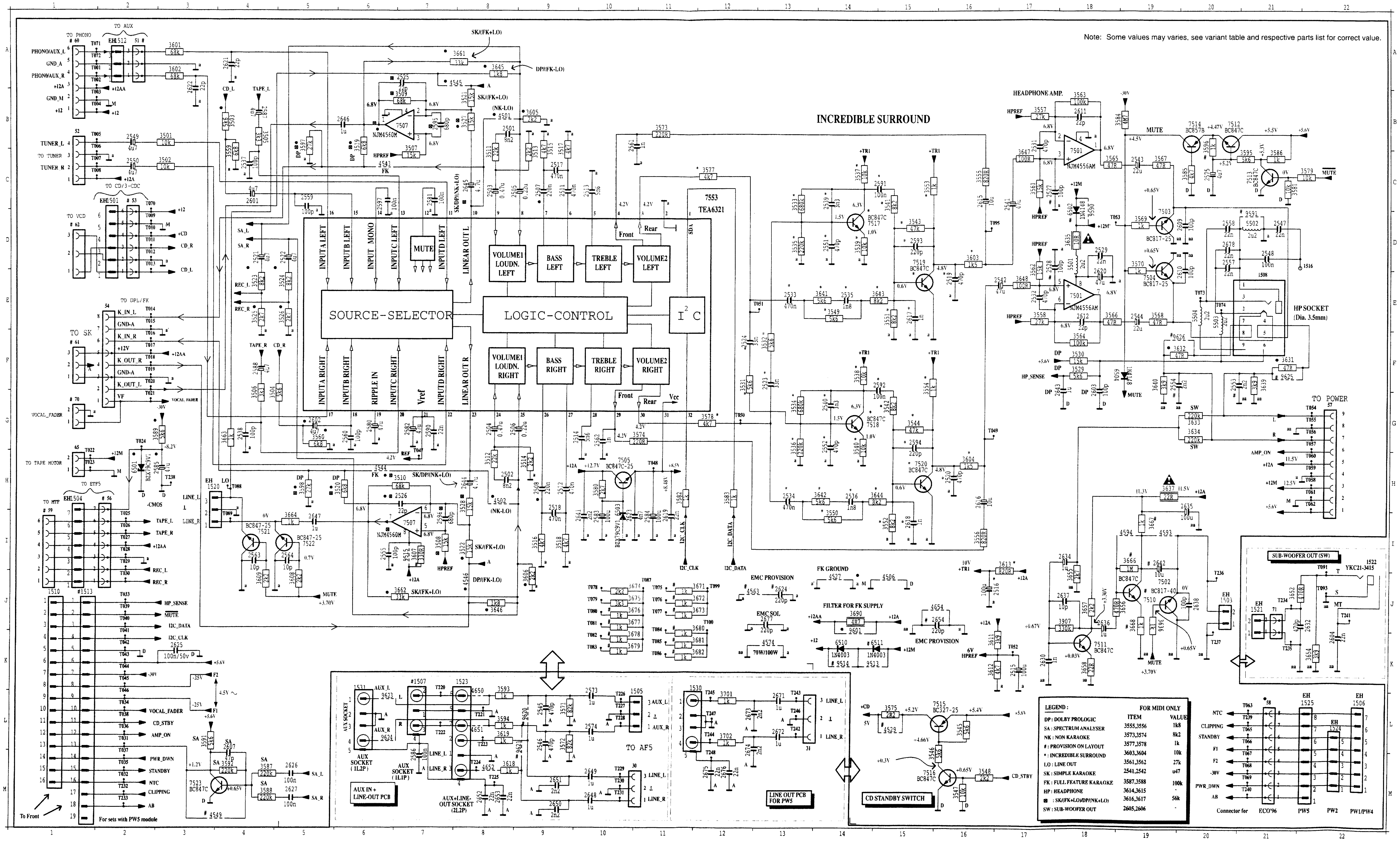
9620	L 9
9621	L 9
9623	L 6
9624	L 6
9625	F21
9626	F19


SOURCE-SELECTOR
LOGIC-CONTROL
I2C
INCREDIBLE SURROUND
HEADPHONE AMP.
MUTE
VOLUME1 LOUDN. LEFT
BASS LEFT
TREBLE LEFT
VOLUME2 LEFT
VOLUME1 LOUDN. RIGHT
BASS RIGHT
TREBLE RIGHT
VOLUME2 RIGHT
7553 TEA6321
TO PHONO
TO AUX
TO TUNER
TO CD/3-CDC
TO VCD
TO DPL/FK
TO SK
TO TAPE MOTOR
TO ETF5
TO MTF
TO POWER
HP SOCKET (Dia. 3.5mm)
SUB-WOOFER OUT (SW)
EMC PROVISION
FK GROUND
FILTER FOR FK SUPPLY
AUX IN + LINE-OUT PCB
LINE OUT PCB FOR PW5
CD STANDBY SWITCH
TO AF5
For sets with PW5 module
To Front
Connector for ECO'96
PW5
PW2
PW1/PW4

Note: Some values may varies, see variant table and respective parts list for correct value.

LEGEND :

DP : DOLBY PROLOGIC
SA : SPECTRUM ANALYSER
NK : NON KARAOKE
: PROVISION ON LAYOUT
* : INCREDIBLE SURROUND
LO : LINE OUT
SK : SIMPLE KARAOKE
FK : FULL FEATURE KARAOKE
HP : HEADPHONE
▣ : SK/(FK+LO)/DP/(NK+LO)
SW : SUB-WOOFER OUT

FOR MIDI ONLY

ITEM	VALUE
3555,3556	1k8
3573,3574	8k2
3577,3578	1k
3603,3604	10k
3561,3562	27k
2541,2542	u47
3587,3588	100k
3614,3615	-
3616,3617	56k
2605,2606	-

9620, 9621 } Provision for Dual Aux-In

1531, 9623, 9624 } For Power 5 Only

4650, 4651 } Used when 1507 OR 1523 is used